the OIL AND GAS JOURNAL

What makes a Rock Bit great?

Operators say...

HUGHES ROCK BITS MAKE MORE HOLE IN LESS ELAPSED TIME UNDER ANY CONDITIONS

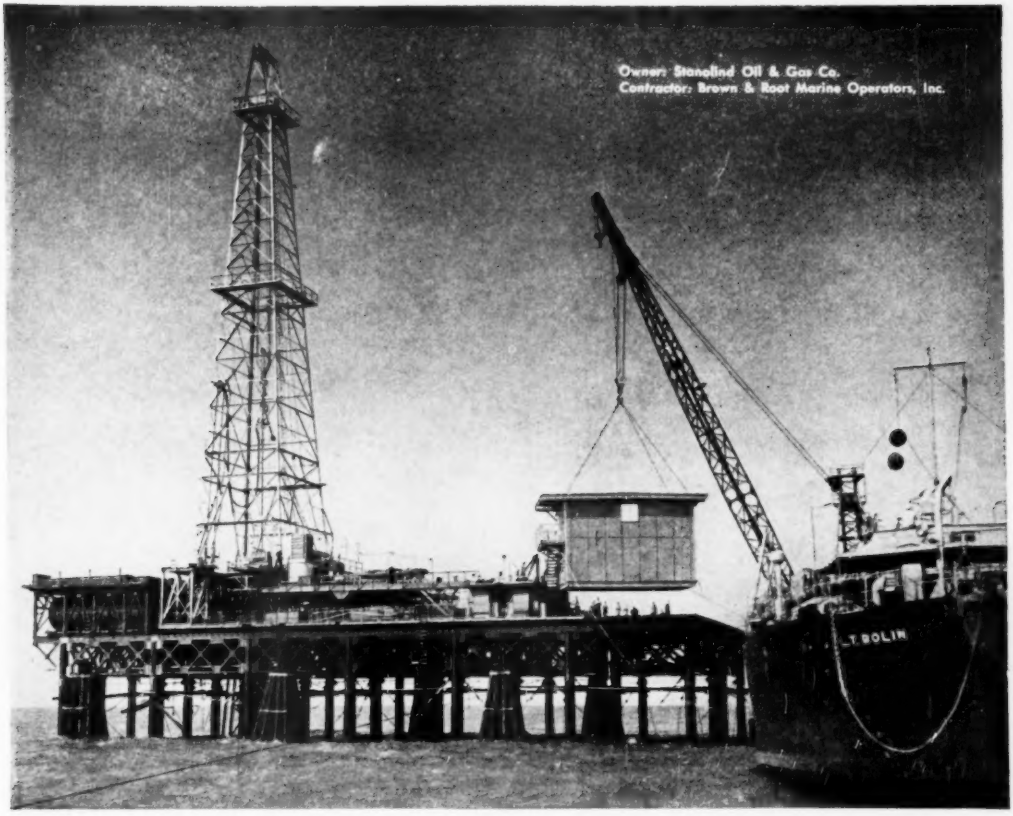
The superiority of Hughes Rock Bits is readily attested by their widespread world-wide use. Their marked ability to make more hole in less elapsed time means a saving to operators in rig time and mechanical costs.

For any type digging, there's a Hughes Tri-Cone designed to insure maximum penetration in minimum time . . . a Hughes "Engineered Solution" for your every drilling problem.

HUGHES
TOOL COMPANY
HOUSTON, TEXAS
WORLD STANDARD OF THE INDUSTRY

PRICE 50 CENTS TABLE OF CONTENTS PAGE 33 **JULY 7, 1949**

INTRICATE FABRICATING
Buell van Tongeren Catalyst Collector
built by Wyatt's EXACTING WORKMANSHIP
Wyatt's
HOUSTON - DALLAS



ISLAND OF STEEL

in the Gulf of Mexico

This 80-ft x 193-ft drilling platform, built for Stanolind Oil & Gas Co., stands 6½ miles offshore in the Gulf of Mexico, approximately 18 miles from Sabine, Texas. The huge structure is supported by thirty-six welded steel piles, ⅝ in. wall thickness by 30 in. diameter, which are driven in seven bents, 30 ft on centers. It is designed to withstand hurricane winds, and is capable of drilling wells 15,000-ft deep.

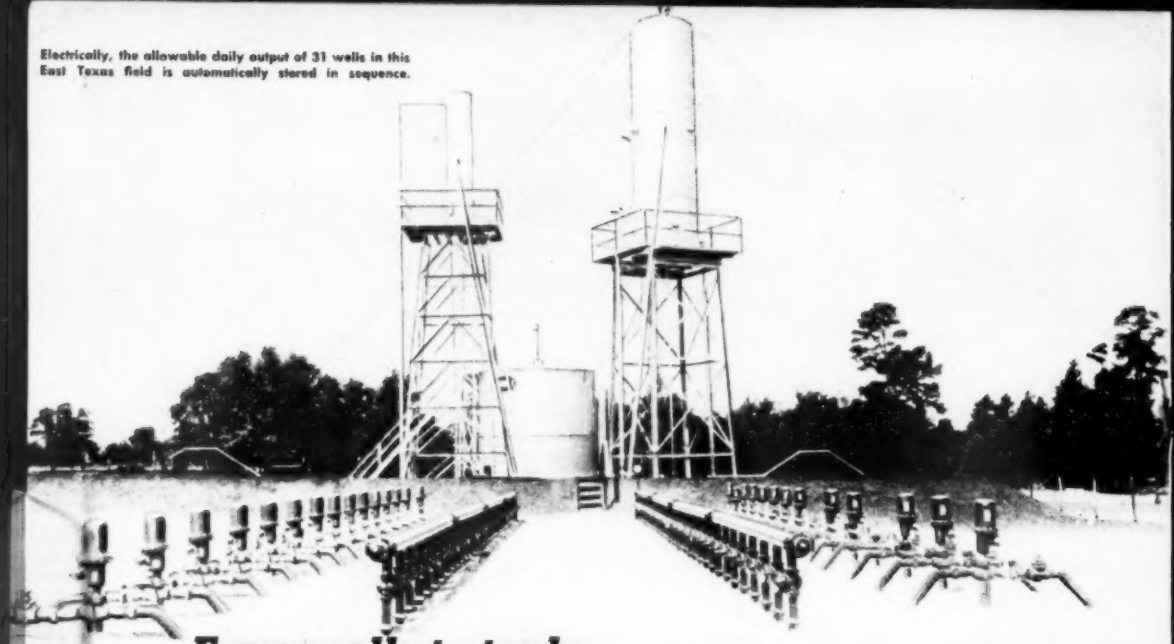
In addition to fabricating its rugged steel piles and deck framing, Bethlehem also supplied rolled steel for use in erecting the personnel quarters and storage building, as well as pumps, wire rope, and other types of steel equipment.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
FABRICATED STEEL CONSTRUCTION
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

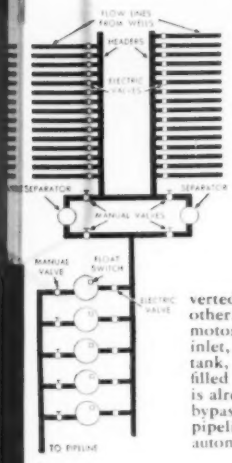
The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter at post office at Tulsa Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1949

Electrically, the allowable daily output of 31 wells in this East Texas field is automatically stored in sequence.



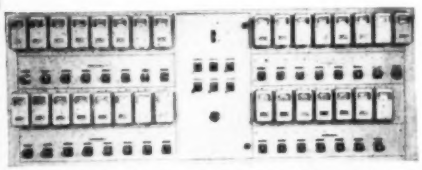
From wells to tanks—
AUTOMATICALLY!

Another example of General Electric oil field electrification!



THIS IS THE WAY IT WORKS!

As this schematic layout shows, all well lines are opened and closed by motor-driven hydraulic valves, actuated by time switches. Any well can also be flowed by a manual valve in parallel with automatic valve. After passing through headers and separators, well flow is automatically diverted from one storage tank to another. This is done by means of a motor-operated valve in each tank inlet, a special float switch atop each tank, and a control panel. Tanks are filled in sequence, with any tank that is already filled or on pipeline being bypassed. If all tanks are full or on pipeline, the system shuts itself off automatically.



HERE'S THE HEART OF THE SYSTEM! This G-E central control panel, which governs the lease's entire producing schedule, contains master switch, manual tank-valve switches, and sequence selector. Flanking it are 31 G-E time switches and manual switches for all wells. Ample room at the bank of the panel makes for easy inspection and repair.

Here is just one of many illustrations of the savings that electrification can bring to oil production. In the case of this East Texas oil field, an electrically-controlled system utilizing General Electric control throughout now makes possible *automatic* control of the allowable production of 31 flowing oil wells and a battery of five storage tanks!

By eliminating manual operations, this electrified system reduces necessary walking to and from wells, since it requires little or no attention by the operator. This frees the operator for other duties, helps cut lease operation costs.

HOW CAN YOU CUT COSTS ELECTRICALLY?

Whether your job is drilling, well pumping, or pipe-line pumping, there are plenty of ways in which electrification can help you do it more efficiently, more economically. They're described in Bulletin GES-3485, "More Oil at Less Cost—Electrically." Send for your copy today.

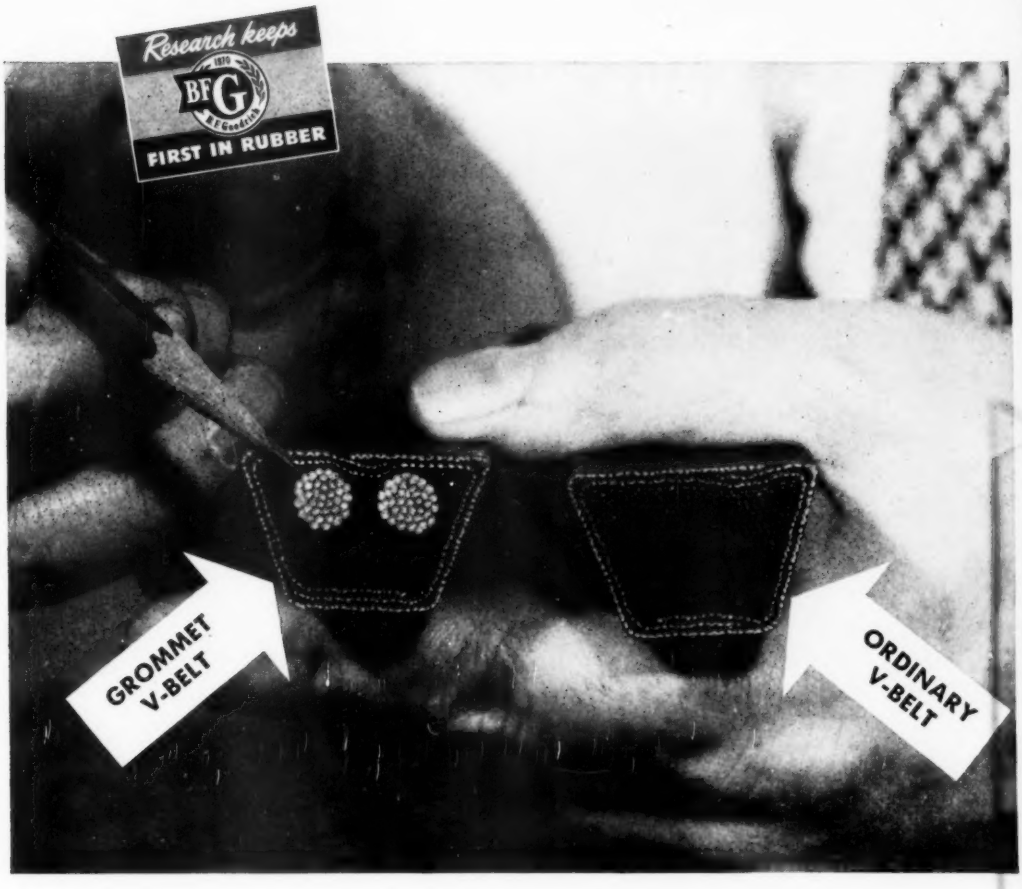
A MOVIE WORTH SEEING!

It's "Lease on the Future", a motion picture on oil field electrification, in full color and sound. Ask your nearest G-E office about having it shown to your organization.

More Power to America

Apparatus Dept., General Electric Company, Schenectady 5, N. Y.

GENERAL ELECTRIC



20 to 50% more V-belt value at no extra price

Exclusive B. F. Goodrich grommet construction cuts belt costs

B. F. GOODRICH grommet V belts are actually a premium belt at *no extra price*, because they deliver more horsepower and outlast ordinary V belts of the same size. Grommet construction (U. S. Patent No. 2,233,294) is the reason these belts give you more for your V-belt dollar.

Higher flexibility, better grip — A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends (as in an ordinary V-belt cord section), no weakened, stiff section where a "splice" occurs. This means better flexibility, better gripping power — up to ⅓ more power to you!

Concentrated cord strength — All the cord in a grommet V belt is in the twin grommets, placed close to the pulley driving faces for maximum power delivery. There is no wasteful dispersal of cord strength, no uneven load distribution. That is why — size for size — grommet V belts can take heavier shock loads, with a higher safety factor.

20 to 50% longer life — Grommet V belts, tested on multiple drives, actually lasted 20 to 50% longer than ordinary types of Multi-V belts! For one thing, 85% of the failures that occur in ordinary belts at the "splice" section, cannot occur in grommet belts where the cord is *endless*. And all the cords work equally in a grommet belt, no cords overwork. Less heat is generated, cord and adhesion failures are fewer.

Twin grommet construction is a B. F. Goodrich "exclusive". Now made in D and E sizes only. To make sure you get genuine grommet V belts, see your local distributor. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

WHATEVER YOUR JOB IN THE OIL COUNTRY

Make Bovaird your Source of Supply

Bovaird's conveniently located supply stores in Kansas, Illinois, Oklahoma and Texas maintain complete stocks of equipment and supplies for virtually every oil industry need. And in order to give you faster, more complete service, Bovaird personnel keeps informed on the latest field conditions and equipment vital to your operations. There's a Bovaird store near your job — make it your supply headquarters. Remember, you can depend on anything you "Buy From Bovaird."

"Buy From Bovaird"

SUPPLY BOVAIRD COMPANY

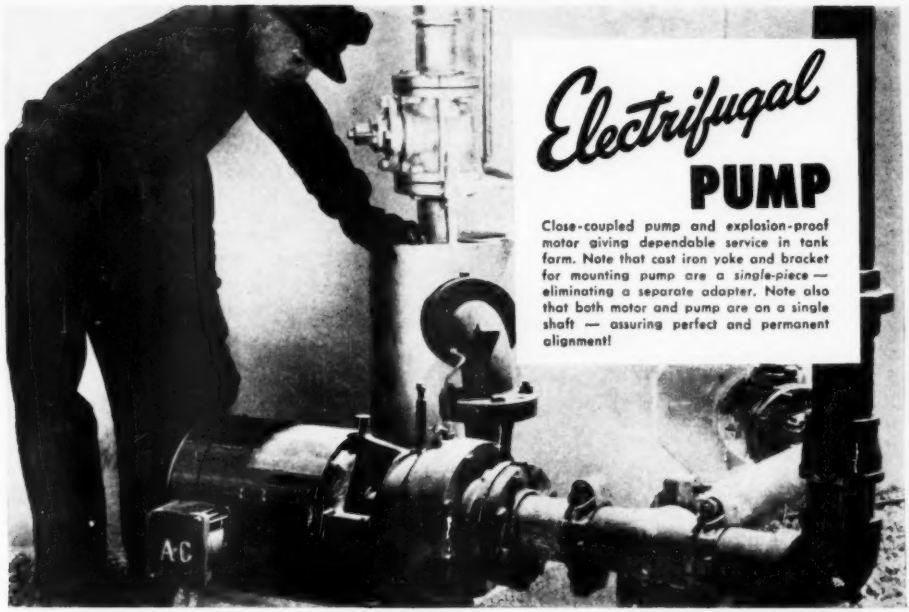
OFFICES AND STORES

ILLINOIS—Clay City, Grayville, Salem
KANSAS—Chase, McPherson, Pratt, Russell, Wichita
OKLAHOMA—Duncan, Oklahoma City, Pauls Valley, Sapulpa, Seminole
TEXAS—Borger, Dallas, Odessa, Pampa

THE BOVAIRD SUPPLY CO.

GENERAL OFFICES: TULSA, OKLAHOMA

How Unit Construction Cuts Petroleum Pumping Costs



Electrifugal **PUMP**

Close-coupled pump and explosion-proof motor giving dependable service in tank farm. Note that cast iron yoke and bracket for mounting pump are a *single-piece* — eliminating a separate adapter. Note also that both motor and pump are on a single shaft — assuring perfect and permanent alignment!

SAVES YOU MONEY THESE 3 WAYS:

- **In Installation** — Installation is easier, quicker — pump comes ready to run. No alignment problems. No extra parts. Easy to handle. Requires small space.
- **In Operation** — Pump and motor designed together to give high efficiency. Every unit tested and guaranteed.
- **In Maintenance** — Cannot get out of alignment. Has fewer parts and fewer machined fits. Bronze wearing ring protects casing from wear and is easily replaced when required.

The *Electrifugal* pump, ranging from 10 to 1600 gpm with heads to 525 feet, is just one of many types of pumps built by Allis-Chalmers for industrial service. You can depend on the recommendations of the A-C pump application engineer to give you dependable service at lowest cost. For information, see your Allis-Chalmers Authorized Dealer or Sales Office or write for Bulletin 52B6059E. A-2774

ALLIS-CHALMERS, 1059A SO. 70 ST.
MILWAUKEE, WIS.

Electrifugal and *Texrope* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Power, Electrical, Processing Equipment for Petroleum Industry

TURBINE-GENERATORS | BLOWERS and COMPRESSORS | TRANS-FORMERS | UNIT SUBSTATIONS | MOTORS—*TEXROPE* DRIVES-CONTROL | CENTRIFUGAL PUMPS

In the Heart of the Nation

...A Better Supply Service

History in song and oil has been written around the Wabash and Ohio Rivers. Near the heart of the nation where these two meet, oil men get a helping hand from conveniently located Jones & Laughlin Supply stores. Each is thoughtfully stocked with materials which correctly fit the needs of the area. Try this better supply service for all your Tri-State requirements.

Jones & Laughlin Supply Company

Subsidiary of Jones & Laughlin Steel Corporation

Stores and Offices in 17 States

General Office

Tulsa, Oklahoma

J&L STEEL

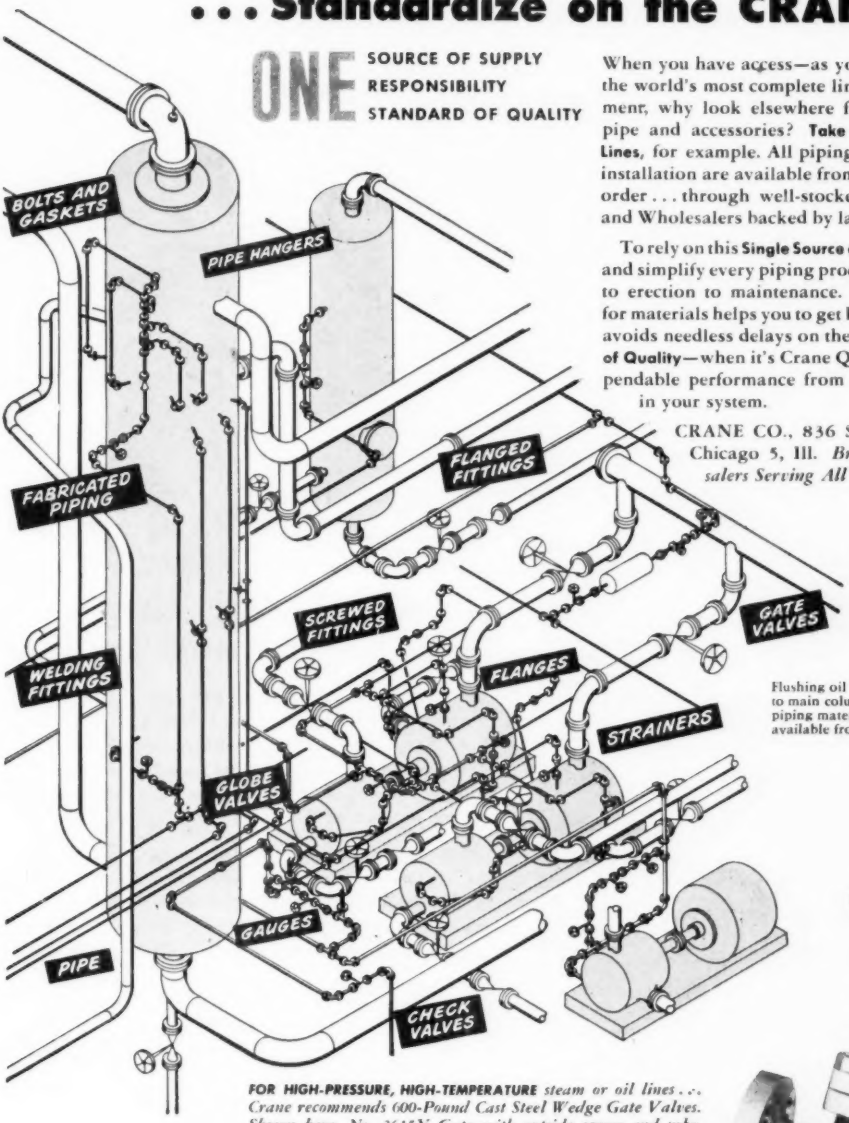
How to simplify piping jobs ... Standardize on the CRANE line

ONE SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY

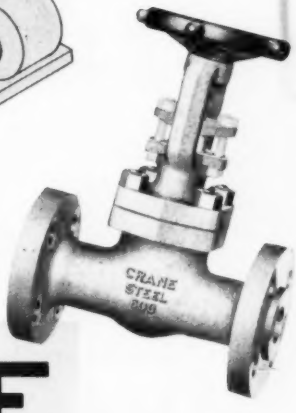
When you have access—as you do at Crane—to the world's most complete line of piping equipment, why look elsewhere for valves, fittings, pipe and accessories? **Take these Flushing Oil Lines,** for example. All piping materials for the installation are available from Crane . . . on one order . . . through well-stocked, local Branches and Wholesalers backed by large factory stocks.

To rely on this **Single Source of Supply** is to speed and simplify every piping procedure from design to erection to maintenance. **One Responsibility** for materials helps you to get better installations, avoids needless delays on the job. **One Standard of Quality**—when it's Crane Quality—assures dependable performance from every piping item in your system.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill. *Branches and Wholesalers Serving All Industrial Areas.*



Flushing oil lines to main column—all piping materials available from Crane.



FOR HIGH-PRESSURE, HIGH-TEMPERATURE *steam or oil lines . . . Crane recommends 600-Pound Cast Steel Wedge Gate Valves. Shown here, No. 3615X Gate with outside screw and yoke. Exelloy to Exelloy seating makes these valves ideal for oil and oil vapor services up to 1000 deg. F. Flanged, screwed, or socket-welding ends. Sizes ½ to 2 in. See your Crane Catalog.*

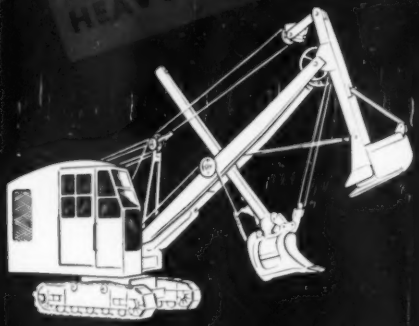
EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM

MORE WORK-TIME



DUAL PURPOSE BOOM SAVES UP TO 20% ON SHOVEL, PULL-SHOVEL COMBINATION . . . .

When you have pipeline foundation trenches or drainage ditches to dig, you can quickly convert this Koehring 205 from shovel to pull shovel. Both attachments use the same boom . . . conversion equipment costs 20% less than conventional units that require two separate booms. Quick convertibility to dragline, clamshell, lift crane or pile driver further increases its all-purpose efficiency.

INDEPENDENT TRACTION cuts non-productive time

Here's a heavy-duty excavator that gives you the fast-working speeds and mobility you need on oil field operation. You have 2-speed traction that is independent of all other operations . . . travels, swings, hoists, raises or lowers boom all at same time. Cuts non-productive time . . . steps up production on some work as much as 50%.

Chain drive gives fast operating speeds . . . crowds up to 84' per minute . . . retracts 143' per minute. Crowd and retract cable is self-contained in boom, stays intact when boom is removed . . . speeds conversion from shovel to other attachments . . . saves time lost in reeving.

Other Koehring 205 features that assure you more production at lower costs include: double-fulcrum clutch, to reduce manual operating effort . . . heavy-duty, accessible machinery, to minimize maintenance . . . choice of crawler mounting or pneumatic tires, to suit your exact operating conditions.

Get all the facts on this versatile Koehring heavy-duty Half-Yard *today*. Write for new 28-page catalog . . or call your nearest Koehring distributor . . . located in all major oil field centers. Ask, too, about other Koehring sizes: ¾-yd. 304 . . . 1½-yd. 605 . . . and the big 2½-yd. 1005

KKM552 rg

KOEHRING HEAVY DUTY

KOEHRING COMPANY
Milwaukee 10, Wis.

Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

with these MOBILE HEAVY-DUTY UNITS

PORTABLE 1-BAG MIXER re-mixes every batch...

For top-quality concrete produced at top speed . . . on any location . . . check the extra time and money-saving advantages this handy Kwik-Mix 6-S DANDIE offers you. You get sturdy construction without overweight for frequent moves on your job . . . leaf springs and pneumatic tires cushion the rigid frame against road and operating shocks. It's smooth-trailing, easily spotted by hand at pouring location.

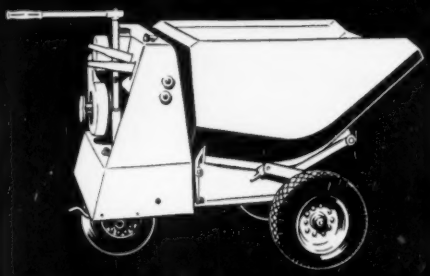
You get thorough-strength mix every batch because the Kwik-Mix re-mixing drum adds a lateral folding action to the customary up-and-down mixing motion . . . completely cement coats each aggregate. Automatic water-measuring tank accurately discharges water to within fraction of a pint . . . when skip raises, water valve trips automatically starting flow into drum at precise moment to eliminate clogging. Power-raised skip and Selective Skip Shaker for faster charging . . . plus tilted Flow-Line discharge chute . . . save seconds every batch, more batches per hour. One man can handle all operations.

Send for full information on this 6 cu. ft. 6-S . . . or on the 3½-S, 11-S, or 16-S DANDIES . . . or see your local Kwik-Mix distributor TODAY.

KOEHRING PRODUCT

DANDIE—Trademark Reg. U. S. Pat. Off.

KWIK-MIX COMPANY, PORT WASHINGTON, WISCONSIN



KWIK-MIX MOTO-BUG TAKES HARD WORK AND HIGH COSTS OUT OF MATERIALS-HANDLING

Now you can cut handling costs way down on wheelbarrow work and all small materials-moving jobs. Kwik-Mix Moto-bug, with its 1200 lb. capacity, makes more trips per hour, because power does *all* the heavy work . . . hauls over 4 times the normal wheelbarrow load. Has speeds 1½ to 4 m.p.h., forward and reverse. No pushing . . . no pulling. Easily climbs grades to 20% with full load. Platform body available. Get all the facts on this low-cost, 3.9 h.p. Moto-Bug by returning the coupon below!

TO: KWIK-MIX COMPANY, Dept. GO
Port Washington, Wisconsin

Please send the complete MOTO-BUG story to:

Name..... Title.....

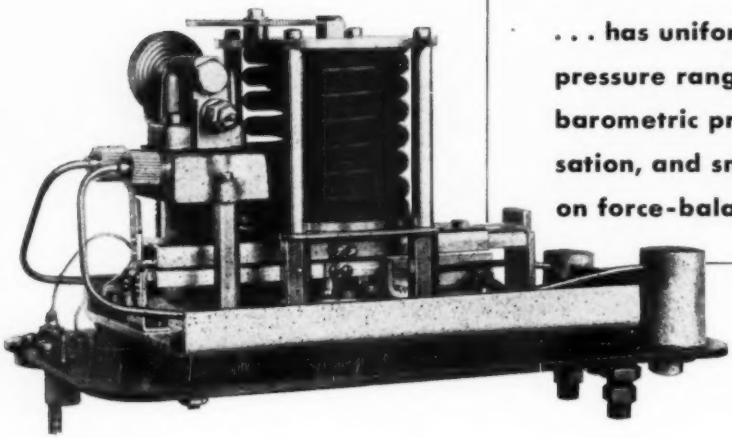
Company.....

Street.....

City..... Zone.... State.....

New Taylor Temperature Transmitter with SPEED-ACT

TRANSAIRE*



. . . has uniform output pressure range of 3 to 15 psi, barometric pressure compensation, and small bulb. Works on force-balance principle.

AT a meeting in Texas the other day, oil men praised this new Taylor TRANSAIRE force-balance temperature transmitter for three features above all others:

1. Standard output pressure range of 3 to 15 psi cuts maintenance, making special calibration of receivers unnecessary.

2. Barometric, temperature compensation, exclusive with Taylor, is vitally important where close temperature measurement and control are critical.

3. Cigarette-size bulb speeds up response; can be installed in limited space.

IN ADDITION, SPEED-ACT, employing for the first time derivative response to the measuring system, may be added to compensate for thermal lags where separable wells are required.

OTHER IMPORTANT ADVANTAGES FOLLOW:

***Faster*—63%** response in less than 2 seconds.

Up-to-1000-feet pneumatic transmission of temperature with extreme accuracy.

Little or no maintenance needed, thanks to force-balance principle which practically eliminates wear.

Short, shiftable range spans with a simple screwdriver adjustment.

Great overrange protection. Overall temperature limits from minus 375° to 1000°F.—with overrange protection to 1000°F.

No electrical hazard in explosive atmospheres.

A positive-acting pilot valve assures quick changes in transmission pressure, overcomes effect of minor leaks.

TRANSAIRE with Speed-Act is the latest step in Taylor's program to produce industrial instrumentation unsurpassed in *accuracy* and *durability*. Ask your Taylor Field Engineer or write for **Bulletin 98140.** Taylor Instrument Companies, Rochester, N.Y., or Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.*

* Registered Trade-Mark

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

Where WeldOlet is attached to run pipe, it tapers at proper angles, providing for a single bevel groove joint at the crotch section, blending into a V-butt joint at the ear portion.

The quickest — most economical — way to insure FULL PIPE STRENGTH AT BRANCH CONNECTIONS

WeldOlets*, with outlet sizes from ⅛" to 24", both straight and reducing, need no additional reinforcement to establish and fully maintain original strength on ASTM A-106 Seamless Steel Grade A Pipe, as set forth in Code for Pressure Piping, American Standards Association, B31.1-1942, and Supp. No. 2, B31.1b-1947. WeldOlet welding fittings provide the quickest, most economical, most *satisfactory* method of obtaining *full pipe strength* at branch connections. For detailed engineering reference data, write for Catalog W-2.

BONNEY FORGE & TOOL WORKS

FORGED FITTINGS DIVISION • 366 GREEN STREET • ALLENTOWN, PENNA.
Authorized Canadian Distributor: Sterling Steel Co., Ltd., 20 Temperance St., Toronto 1, Canada
MANUFACTURERS OF FAMOUS BONNEY TOOLS

Fig. 1—Cut-away view of reducing size WeldOlet with welding outlet in place. The external rib and wide bases or footings of WeldOlets* eliminate the need for *extra supports* to take care of bending or vibrational stresses at crotch section, the point of greatest stress.

Fig. 2—Note blending of ear portion of welding fitting to run pipe. Extension of weld metal below inside scarfed portion of pipe insures all sections of joint greater than pipe wall thickness.

WELDOLETS

*Trade Mark Reg. U.S. Pat. Off. Pat. in U.S. & Foreign Countries

FOR WELDED BRANCH PIPE OUTLETS

When you want Bonney Welding Outlets, ask for WeldOlets*

now
FIELD
MILL
LABORATORY
REPUBLIC'S 3-DIMENSION
Metallurgical Service...

it's Your Move!

REPUBLIC'S 3-Dimension Metallurgical Service May Uncover Your Answer to Production Speed-Up —Improved Quality—and Lower Costs!

Unless you are completely satisfied with your product on these three counts: (1) rate of output; (2) quality; and (3) cost of production, your next move in the approaching battle for business should be a complete check-up on the alloy steels best suited to your product, to your processing methods and to your equipment.

In industry after industry, REPUBLIC'S 3-Dimension Metallurgical Service has been matching the correct alloy steel to specific applications for years. Invariably, this problem has been 3-dimensional, too—requiring full consideration for: (1) the effectiveness of the steel and what it can do for the product; (2) the processing necessary to obtain desired results; and (3) the cost of the steel itself.

Here's how this service works: A Republic *Field* Metallurgist, together with your own metallurgists and engineers, studies your problem right in your plant under actual operating conditions. His work then is complemented by and coordinated with that of Republic's *Mill* Metallurgists and *Laboratory* Metallurgists.

The Result: Just the steel you need for every application—quality and salability for your product—high productive efficiency—low unit costs. In other words . . . the most you can get for your money.

Are you wondering what alloy steels can do for you—or if you now are using them correctly? Ask the men who *know—ask REPUBLIC!*

REPUBLIC STEEL CORPORATION • Alloy Steel Division, Massillon, Ohio
General Offices, Cleveland 1, Ohio • Export Department: Chrysler Building, New York 17, N. Y.

to assist you!

Republic **ALLOY STEELS**

REPUBLIC STEEL

HERE IT IS!

. . . THE NEW MULTI-STAGE COOLING TOWER

. . . the Result of 10 Years of Research and EXHAUSTIVE TESTS

. . . FOR THE WORLD'S LARGEST LUBE PLANT

Top view of the 48'-0" wide x 408'-0" long x 28'-6" high, 34-cell, Multi-Stage Cooling Tower designed and erected for the World's Largest Lube Plant.

51,000 Gallons of water per minute . . . 3,060,000 gallons of water per hour . . 73,440,000 gallons of water per 24-hour day . . . cooled to a guaranteed temperature with this 34-cell Multi-Stage Induced Draft Cooling Tower.

NEW IN *ENGINEERING* . . . IN *PERFORMANCE* . . . *ADAPTABILITY*

The above installation represents not only new designing to meet the requirements of the Petroleum and Chemical Industries, but is the results of 10 years of research and testing to meet the trends towards higher efficiency in Cooling Tower performance with increased temperature ranges and closer approach to the ambient wet bulb temperature. Water Cooling Equipment Company Engineers have created the above Multi-Stage Cooling Tower which attacks a hard cooling condition and solves the problem by breaking it into easier cooling conditions which are easier to accomplish. It is, in effect, two or more Cooling Towers operating in series within a SINGLE enclosure and operated with a SINGLE pumping of the water. The internal arrangement provides the serial flow of all the water from one bank of Filling to another, permitting intimate contact with separate streams of outside ambient air in counterflow through each bank. The IMPORTANT factor in this Cooling Tower is . . a high water-to-air ratio is maintained making it possible to increase greatly the enthalpy of the outgoing air over that even theoretically possible with the single pass arrangement in either counterflow or cross-flow Cooling Towers. This is an engineering triumph.

TODAY'S HOT WATER COOLING PROBLEMS CANNOT BE SOLVED WITH YESTERDAY'S METHODS

WATER COOLING EQUIPMENT CO.

NEW HAMPSHIRE AND GEORGIA • ST. LOUIS 23, MO.

FULL INFORMATION UPON REQUEST

consider this OUTSTANDING ADVANTAGE of the famous WHELAND SWIVEL

WASH PIPE, special nickel alloy steel, carburized, precision machined, wearing surface heat treated to 600 Brinnell hardness, precision ground, polished and honed for maximum smoothness and minimum packing wear. Wash pipe outside diameters are precision machined in one operation assuring perfect concentricity and perfect alignment. No place to form pockets or restrict mud flow.

Wash pipes can be replaced with minimum time and effort. With just average care, the replacement goes in EASILY and in PERFECT ALIGNMENT.

ALSO IMPORTANT: Spring loaded, lubricated, extra deep, chevron type, wash pipe packing. Lower stem lubricated packing is triple sealed. All packings automatically adjusted, pressure grease lubricated through readily accessible fittings.

All bearings have capacity far in excess of Wheland's capacity ratings. Timken main load bearing with radial and thrust above and below to maintain perfect stem alignment. Upper thrust bearing, tapered cone. All bearings positively sealed off from mud and run in circulated, cooled oil. Large oil capacity.

Long radius gooseneck, streamlined manganese vanadium steel body, lower grease seal, special hold down construction, freedom from adjustments.

4 WHELAND SWIVEL SIZES

Model	E-7000	Capacity	464,300 lbs.	at	100 R.P.M.
Model	E-6600	Capacity	350,000 lbs.	at	100 R.P.M.
Model	E-6200	Capacity	262,000 lbs.	at	100 R.P.M.
Model	E-6100	Capacity	130,000 lbs.	at	100 R.P.M.

"Write Dept. O-1

Bulletin No. 173 sent on request gives details, shows why more and more people are saying:

"WHELAND has the best swivel on the Market."

FIELD SALES REPRESENTATIVES

L. E. FERGUSON
Field Sales Manager
Tulsa, • Phone: 3-5406

F. Y. CRONK, JR.
Tulsa • Phone: 6-4697

CARL K. MOUNT
Bellaire, Tex.
Phone: Madison 2-9588

VANN M. CAMPBELL
Bellaire, Tex.
Phone: Madison 2-4742

GERALD W. HARMAN
Midland, Tex. • Phone: 3805

Service: W. E. SHORTS
Oklahoma City • Phone: 58-7129

WHELAND

THE WHELAND COMPANY, CHATTANOOGA, TENN., U. S. A.
ROTARY DRILLING MACHINERY

DOMESTIC DISTRIBUTORS
Jones & Laughlin Supply Co.
Tulsa, Oklahoma
Stores and Offices in all Principal Oil Fields and Centers

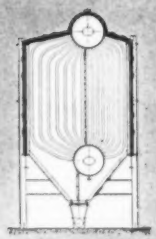
EXPORT DISTRIBUTORS
Lucey Export Corporation
233 Broadway,
New York 7, N. Y.
Broad Street House
London E.C. 2, England

DRAW WORKS • SLUSH PUMPS • ROTARIES • SWIVELS • CROWN BLOCKS • TRAVELING BLOCKS

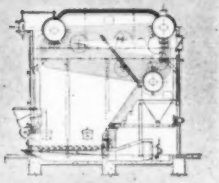
WICKES

STEAM GENERATORS FOR ALL INDUSTRY

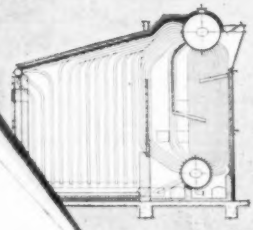
Wickes Steam Generators are in constant daily service in thousands of installations throughout the world. Wickes can fill your exact requirements for boilers of any type up to 250,000 lbs. steam per hour and 850 psi. • Wickes Boilers are engineered for use in oil, chemical, paper and many other industrial uses. Our knowledge of steam generation is available for your consultation, without obligation. Descriptive literature available upon request.



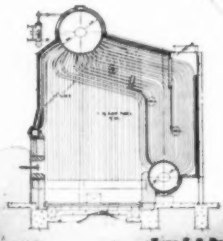
Wickes 2 Drum Waste Heat Installation



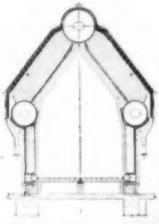
3 Drum Low Head Water Tube Boiler



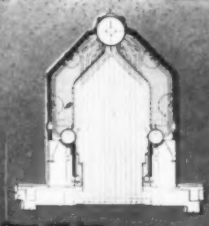
2 Drum Water Tube Boiler



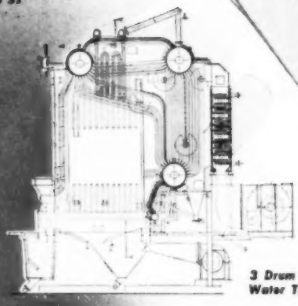
Type-S 2 Drum Boiler Series 51



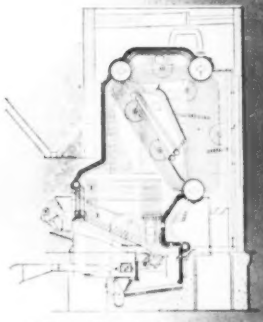
"A" Type Water Tube Boiler



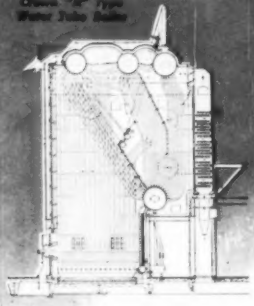
Drum "A" Type Water Tube Boiler



3 Drum "B" Type Water Tube Boiler



3 Drum Water Tube Boiler



4 Drum Water Tube Boiler

THE WICKES BOILER CO.

SAGINAW, MICHIGAN

SALES OFFICES: Atlanta • Boston • Charlotte, N.C. • Chicago Cincinnati • Lenver • Detroit • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • New York City • Pittsburgh San Francisco • San Jose • Seattle • St. Louis • Tulsa • Saginaw Mexico City • Buenos Aires.

DIVISION OF THE WICKES CORPORATION • RECOGNIZED QUALITY SINCE 1854

Big News
FOR HEAVY HAULERS

New "H" model heavy duty GMCs are the biggest truck news of the year . . . and for many years!

They comprise the most complete line of all-new, all-improved heavy duty trucks, gasoline and Diesel, ever introduced at one time . . . 61 basic models with weight ratings from 19,000 to more than 90,000 pounds.

They provide more important new features and advancements than any trucks in GMC history . . . exclusive GMC "Bumper-Built" front end . . . the industry's most powerful engines size for size . . . stronger, safer, roomier cabs . . . improved frames, springs, brakes, clutches, and axles.

They benefit by all the advantages of the truck industry's finest engineering skills and manufacturing facilities.

And they are priced to give substantial savings on the original investment . . . by including needed items of equipment which, in general practice, are added to the base price.

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

GMC
GASOLINE + DIESEL
TRUCKS

Packed with *POWER*

Five power-packed gasoline engines, including a big new "707" of 225 horsepower. Two famous GM 2-cycle Diesel engines of 133 and 200 horsepower.

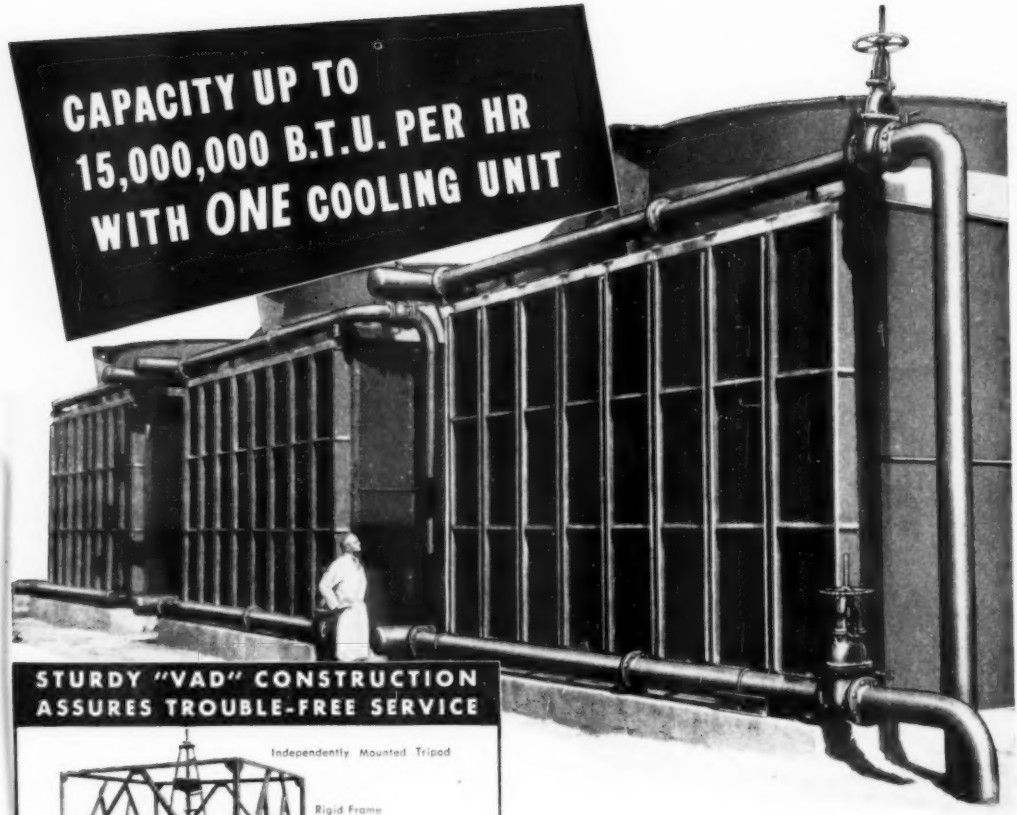
Built to *"TAKE IT"*

Deeper, stiffer frames . . . heavier, wide-track front axles . . . longer front springs with shock-absorbers standard . . . big, fast-acting brakes.

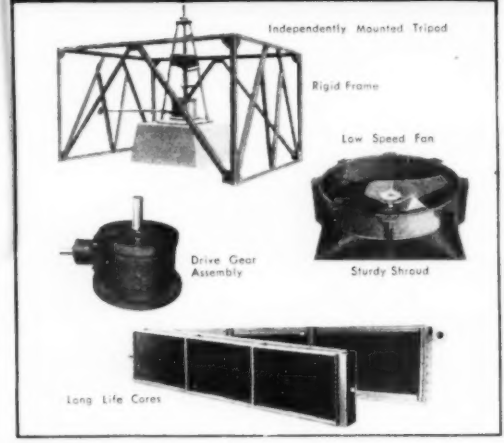
Cabs Up to *1½ FT. WIDER*

More leg room and head room . . . wider doors and windows . . . bigger windshields . . . built-in ventilation . . . snubbed seat action . . . complete insulation.

CAPACITY UP TO 15,000,000 B.T.U. PER HR WITH ONE COOLING UNIT



STURDY "VAD" CONSTRUCTION ASSURES TROUBLE-FREE SERVICE



YOUNG
HEAT TRANSFER PRODUCTS

T. M. REG. U. S. PAT. OFF.

YOUNG RADIATOR CO.
General Offices: Dept. 409-G, Racine, Wis.
Plants at Racine, Wis., and Mattoon, Ill.

OIL FIELD, HEAVY INDUSTRIAL, MUNICIPAL & CHEMICAL PROCESS COOLING EQUIPMENT
Engine jacket water coolers • Oil coolers • Steam and natural gas condensers • Natural gas coolers • Evaporative coolers and condensers • "VAD" Vertical air discharge cooling and condensing units.

AUTOMOTIVE PRODUCTS
Gas, gasoline, Diesel engine cooling radiators • Heat exchangers • Intercoolers • Oil coolers • Supercharger intercoolers.

HEATING, COOLING AND AIR CONDITIONING PRODUCTS
Convectors • Unit heaters • Heating coils • Cooling coils • Air conditioning units • Evaporative condensers.

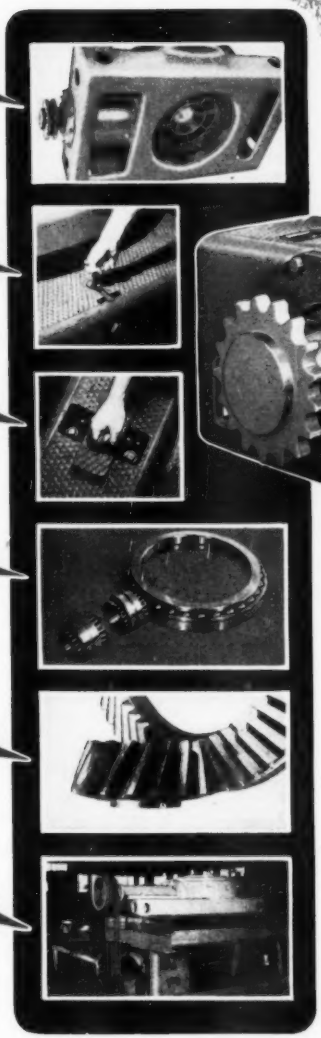
AERONAUTICAL PRODUCTS
Oil coolers • Supercharger intercoolers • Radiators • Heat exchangers • Valves • Regenerators.

DISTRIBUTORS • The Happy Company, 310 E. 20th St., Tulsa, Oklahoma; Flournoy & Everett, Inc., 5043 Santa Fe Ave., Los Angeles 11, California; H. J. Young, 1364 Lake Shore Drive, Muskegon, Michigan. Others in Principal Cities.

YOUNG OFFERS EXTRA CAPACITY WITH THE SPACE-SAVING VAD

● There's a VAD model capable of dissipating from 3,000,000 to 15,000,000 BTU per hr. and for cooling water, oil, gas and condensing steam and vapor, *in any combination of services!* A multiple installation of these units will handle any cooling problem. Such versatility and reserve cooling capacity has earned an enviable reputation for the VAD, successor to the famous QUAD and giant in the Young line of heat transfer products. Such features as improved design, fewer piping connections, factory built sub-assemblies, low-level mounting, vertical air discharge (which prevents lost efficiency due to cross-winds) . . . plus the special construction features shown at left . . . have made the VAD increasingly popular. If you have a BIG cooling job to be engineered, specify VAD, designed and manufactured by Young, specialists for more than two decades in the development of oil field and industrial cooling and condensing equipment. Write for Catalog 448.

PIN DOWN Your Drilling Costs with BREWSTER HIGH-SPEED OIL BATH ROTARIES



MODEL
RS-18

Their rigid box-type construction ❶ make Brewster HIGH-SPEED Rotaries strong, compact, and shock absorbent. Fast positive table locks ❷ give instant control of any rotation. HIGH-SPEED Rotaries have continuous oilbath lubrication at all speeds, with one easily accessible lubrication panel ❸ on table skirt. Pinion shaft is supported by double row tapered bearings; main bearings are self-centering angular contact ❹. High bearing capacities and spiral bevel gear trains ❺ assure efficient, long life operation. Table is slush-proofed by grease filled labyrinth grooves. All rotaries are performance-tested before delivery ❻. Dependable Brewster HIGH-SPEED Rotaries will reduce your deep drilling costs. Write for complete details.

ROTARY MODEL	RS-18	RS-22	RS-27½
Rated Deadload Capacity—Tons	167	265	513
Recommended Drilling Depth	8,000′	12,000′	16,000′
Recommended Maximum Table Speed—RPM	350	600	350
Gear Ratio and Type	3.53:1 (spiral bevel)	3.03:1 (spiral bevel)	3.67:1 (zerol)
Table Opening	18″	22″	27½″

BACKED BY
24-HOUR BREWSTER SERVICE

The BREWSTER Co., Inc.
SHREVEPORT, LOUISIANA

Sold by these supply stores:
- Ajax Equipment Co.
- Industrial Supply Co.
- Rowland Supply Co.
- Murray Brooks, Inc.
- Reams Supply Co.

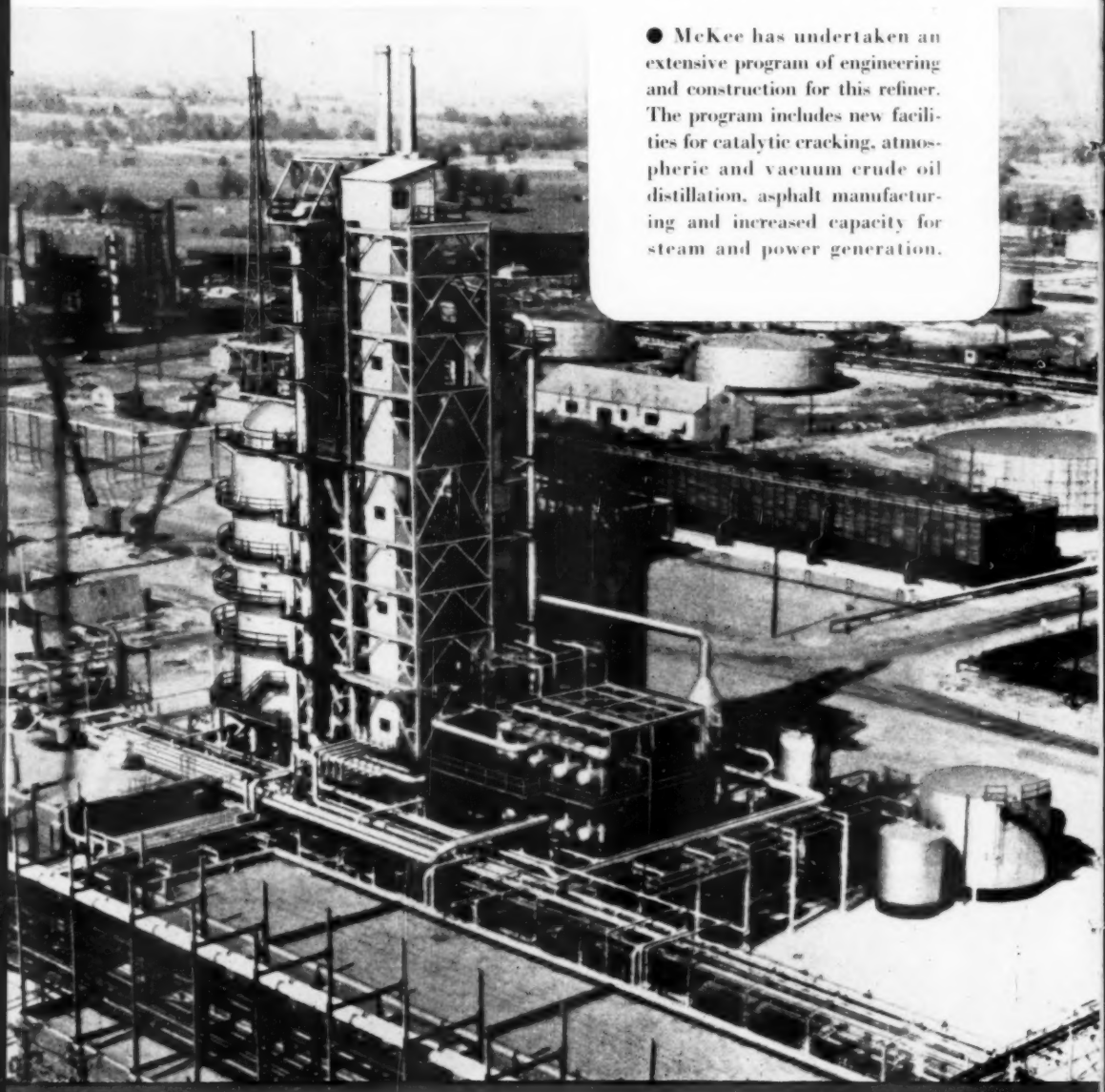
In Canada:
HALEY SUPPLY CO., Calgary

BREWSTER MATCHED *Drilling Equipment*

NEW CATALYTIC CRACKING UNIT

Engineered and Constructed by McKEE

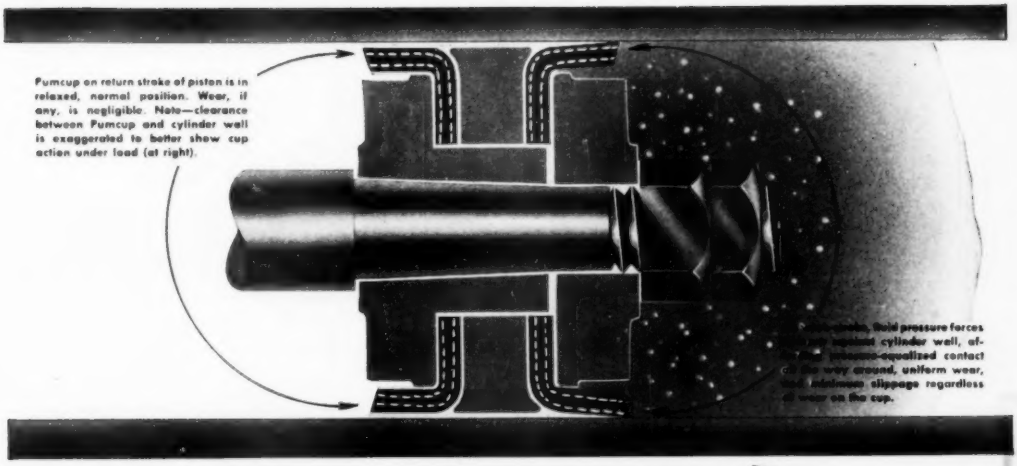
● McKee has undertaken an extensive program of engineering and construction for this refiner. The program includes new facilities for catalytic cracking, atmospheric and vacuum crude oil distillation, asphalt manufacturing and increased capacity for steam and power generation.



ARTHUR G. McKEE & COMPANY

DESIGN, ENGINEERING AND CONSTRUCTION FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES

ENGINEERS AND CONTRACTORS • ESTABLISHED 1905
2300 CHESTER AVENUE, CLEVELAND
30 Rockefeller Plaza, New York, N. Y.


Pumcup on return stroke of piston is in relaxed, normal position. Wear, if any, is negligible. Note—clearance between Pumcup and cylinder wall is exaggerated to better show cup action under load (at right).
PUMP PISTON MOTION

NEW RETIREMENT PLAN . . .

for piston packing

WHAT is the "retirement age" of the piston packing in your reciprocating pumps, or in your air or hydraulic controls? A day? A week? A month?

Think what you could save in maintenance expense, in costly shutdowns, with a packing that does a perfect job 5, 10, or even 100 times as long. That's exactly what Darcova Pumcups are doing in thousands of installations where they have replaced leather crimps, ring packing, metal or plastic rings, or other ordinary packing.

How? First, the drawing above shows how the cup principle, scientifically applied the Darcova way, minimizes friction, equalizes and retards wear. Second, Pumcups are made of a special, Darcova-developed composition, exceptionally wear-resistant and immune to tough pressure and temperature conditions. Third, Pumcups are precision-built in many different textures, each absolutely uniform. Fourth, despite wear, high volumetric efficiency is retained for the life of the packing.

So, if you're not using Darcova Pumcups, you're in line for a new piston packing "retirement plan"—one that will save you plenty of time, trouble and expense. For a free bulletin containing complete information, write, or use the coupon below.

Darcova Pumcups are made in standard sizes from ⅜ to 42 inches in diameter, are easily installed in any reciprocating pump or air or hydraulic mechanism to replace ordinary packing. They handle virtually any fluid under a wide range of pressure and temperature conditions.

DARCOVA
THE ORIGINAL COMPOSITION CUP

DARLING VALVE & Manufacturing Co.
WILLIAMSPORT, PA.

Darling Valve & Mfg. Co., Williamsport 1, Pa.
Please send me the free bulletin checked below:
☐ No. 4401 Darcova Pumcups for reciprocating pumps.
☐ No. 4502 Darcova Pumcups for air or hydraulic mechanisms.

Name_____
Company_____
Address_____
City_____ State_____

Announcing

DAILY FLIGHTS TO VENEZUELA

DIRECT ROUTE TO VENEZUELA-JAMAICA-CUBA

from

NEW ORLEANS and HOUSTON

Chicago & Southern Air Lines announces the inauguration of *daily* flights to and from Venezuela, in answer to the growing public demand. C&S 4-motored Douglas Skymasters now provide seven-days-a-week service linking South America with the oil and industrial area of the Southwest. Direct, one-carrier flights through the Houston and New Orleans gateways to Caracas—each way every day. Ask your travel agent or nearest C&S ticket office for details.

CHICAGO & SOUTHERN AIR LINES

GENERAL OFFICES . . . MEMPHIS, TENNESSEE

C★S

DEPENDABILITY THROUGH RESEARCH AND ENGINEERING

IN INDIAN TERRITORY: running a 5000-foot combination string of 7-inch S-80 SMITHway Casing, in Oklahoma.

ON THE MISSISSIPPI: SMITHway Casing can be shipped by barge as well as by rail. This barge load is going down river to Louisiana.

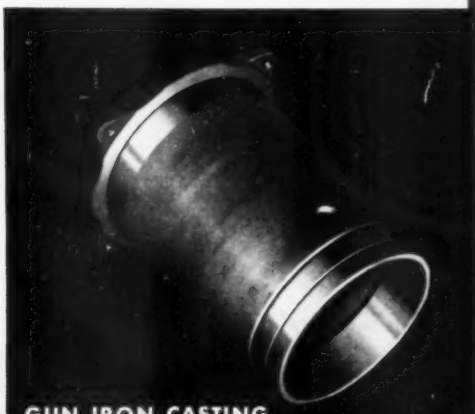
A. O. Smith Steel Smith 75th ANNIVERSARY 1874 1949

SMITH*way* CASING · LINE PIPE

A. O. SMITH CORPORATION

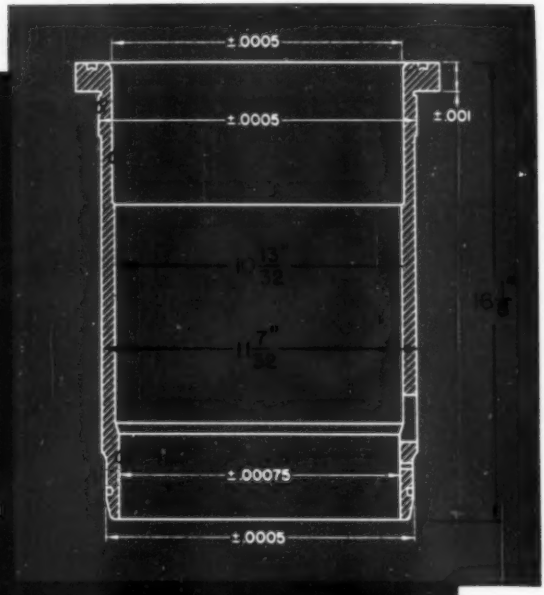
New York 17 • Pittsburgh 19 • Atlanta 3 • Chicago 4 • Tulsa 3 • Dallas 1
Houston 2 • Seattle 1 • Los Angeles 14 • International Division: Milwaukee 1

GUN IRON for wearing-parts:



GUN IRON CASTING
for longer life...resistance to erosion

PRECISION MACHINED
for water-tight assembly



FURNACE to FOUNDRY to FINISHING . . . .
It's a HUNT-SPILLER job

What is GUN IRON?

You'll find all the answers as well as valuable information on other metals and alloys in this interesting metallurgical bulletin. Write for it on your company letterhead. No obligation, of course.

Your cast iron wearing-parts will have longer life, resist heat distortion and withstand greater operating pressures when produced of Gun Iron. In addition, Gun Iron wearing-parts are uniform in every respect since Hunt-Spiller controls all phases of their production from raw material to finished parts. Gun Iron is carefully produced in our own air furnaces—cast in our own foundry—and can be machined to your specifications in our extensive manufacturing plant.

The part above is an example. It is a water jacket for diesel main cylinder liners and is cast of Gun Iron alloy to withstand the erosive and corrosive actions to which these parts are subjected. Hunt-Spiller also machines these parts to the close tolerances shown to assure water-tight assembly with the liners. The liners, too, are produced of Gun Iron to better resist intense heat and frictional wear without distortion or growth.

For 139 years Hunt-Spiller has been producing Gun Iron and its alloys. Today, their use is found in innumerable parts produced for the railroad, diesel, marine, petroleum and metalworking industries. Our engineers stand ready to help you in the application of Gun Iron to *your* wearing-parts . . . our plant facilities are geared to produce those parts accurately and economically.

HUNT-SPILLER GUN IRON • AIR FURNACE PROCESS • HSCI

HUNT • SPILLER
MANUFACTURING CORPORATION

393 DORCHESTER AVENUE • SOUTH BOSTON 27, MASS.

Canadian Representatives: Joseph Robb & Co., Ltd., 4050 Namur St., Montreal 16, P. Q.

NO-OX-ID *Cold Applied* PIPE COATINGS

Offer Seven Positive Advantages

NO-OX-ID "GG," a chemically inhibited, pliable coating can be applied cold, by hand with canvas or leather-faced gloves, eliminating heavy equipment in the field. Its plastic consistency and adhesive strength permit it to contract and expand with the pipe. It bonds securely with one application of minimum thickness, provides high moisture resistance with no changes in physical or chemical composition.

With No. 4 NO-OX-IDized Wrapper, a high tensile strength, laminated, moisture-resistant fabric, the NO-OX-ID is kept in intimate contact with the pipe. A top coating of NO-OX-ID Filler Red "C" as a service coat, brushed on cold, assures a perfect three-way combination of the most positive underground pipe protection.

1. **Eliminate melting kettles, particularly advantageous in hilly country, rough terrain, or congested cities.**
2. **No prime coat is necessary on new pipe.**
3. **Specially adapted for reconditioning used pipe.**
4. **Pliable, plastic consistencies do not deteriorate.**
5. **Pliability permits contraction and expansion with varying pipe temperatures.**
6. **Most conveniently used for maintenance and repair.**
7. **Chemical inhibitors provide positive corrosion protection.**

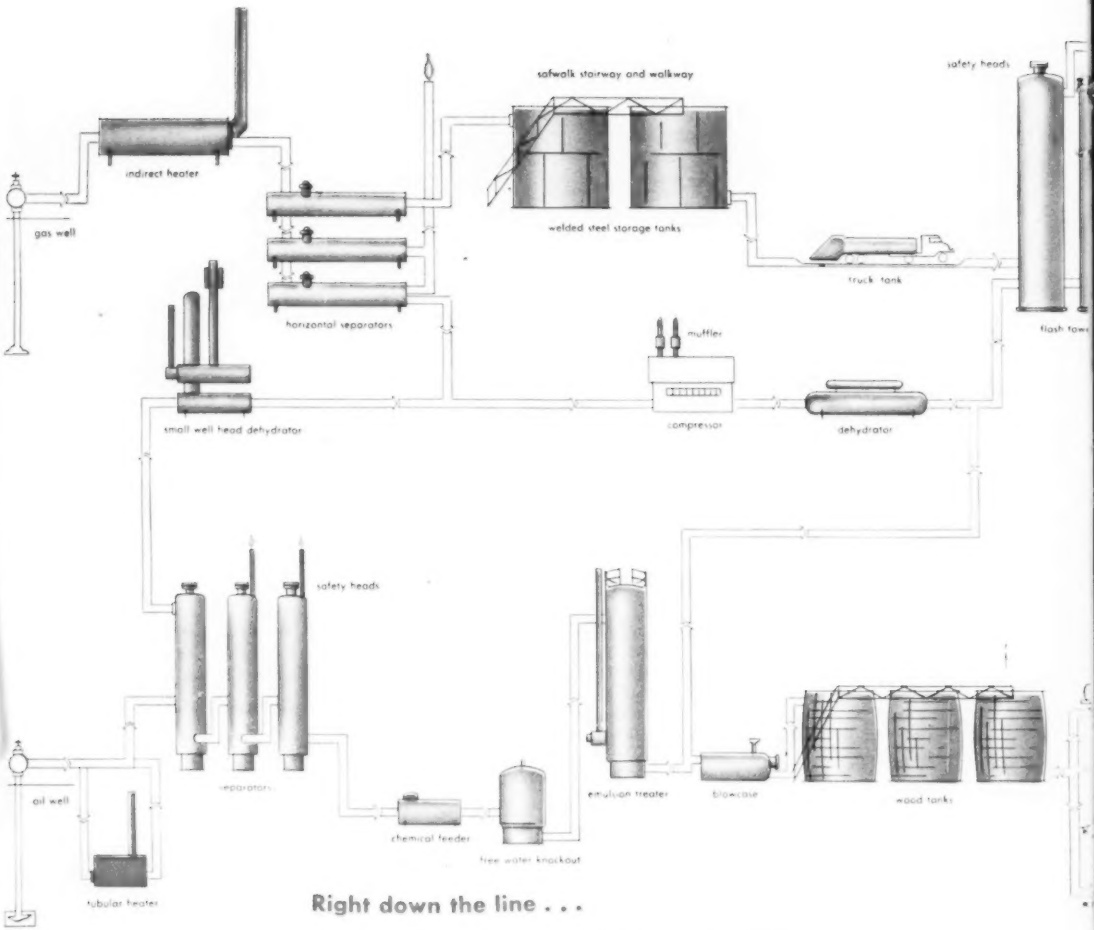
"Piping Hot," a new 16mm sound movie in color on the use of hot applied NO-OX-IDs by stationary machine, is available to companies, engineering clubs or technical societies. Write for booking.

Dearborn
Reg. U. S. Pat. Off.

THE LEADER IN RUST PREVENTIVES AND BOILER WATER TREATMENT

DEARBORN CHEMICAL COMPANY

310 S. Michigan Ave., Chicago 4 • 807-15 Mateo St., Los Angeles
205 E. 42nd St., New York • 2454 Dundas St., West, Toronto

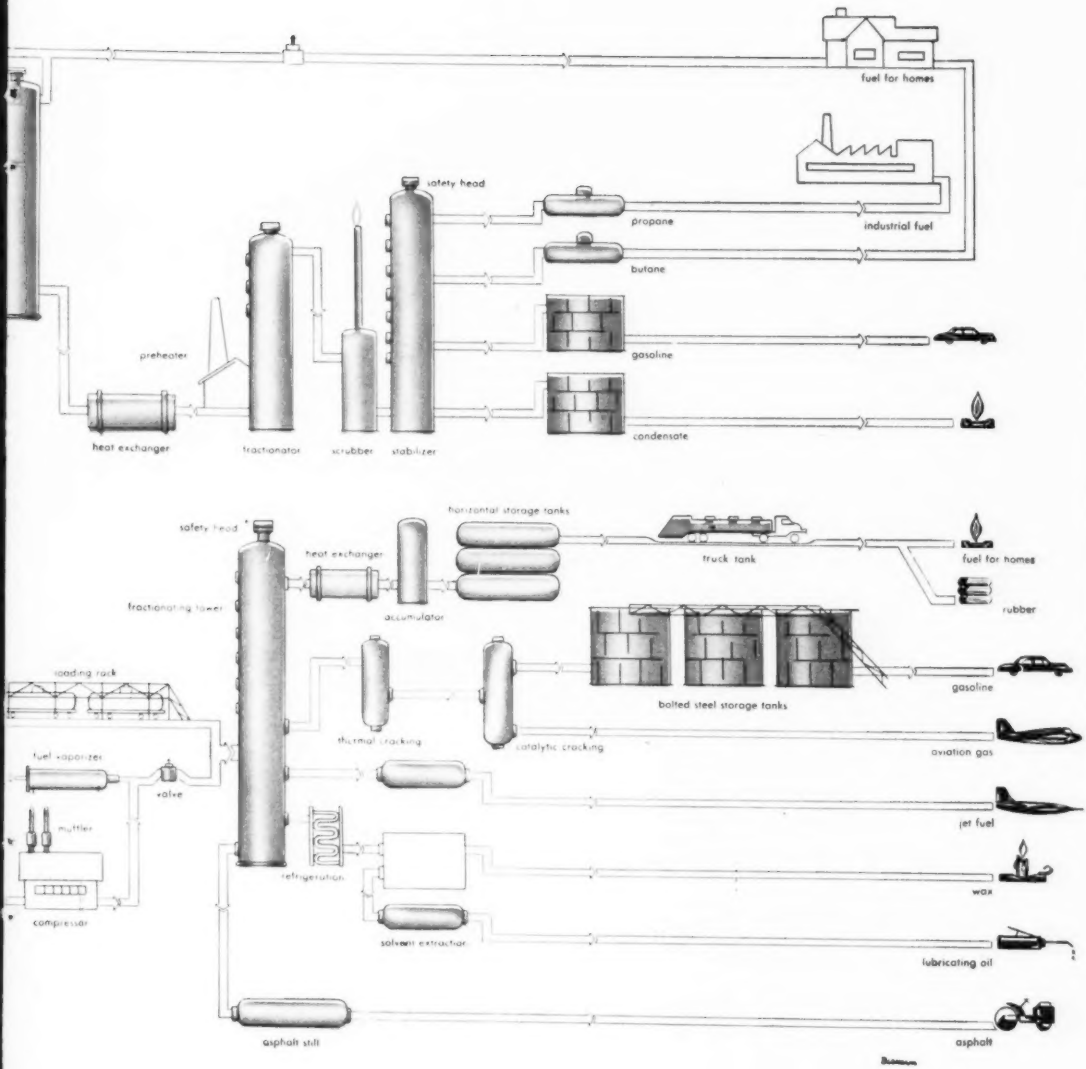


Right down the line . . .

From well head to consumer, it's BS&B equipment wherever you go.

Black, Sivalls & Bryson, Inc.

Kansas City, Mo. Oklahoma City, Okla.


fuel for homes
safety head
propane
industrial fuel
butane
gasoline
preheater
condensate
heat exchanger
fractionator
scrubber
stabilizer
horizontal storage tanks
safety head
truck tank
fuel for homes
heat exchanger
rubber
fractionating tower
accumulator
loading rack
gasoline
bolted steel storage tanks
thermal cracking
catalytic cracking
aviation gas
fuel vaporizer
valve
jet fuel
muffler
refrigeration
wax
compressor
solvent extractor
lubricating oil
asphalt still
asphalt

THERE ARE MANY VALVES FOR OIL, WATER AND GAS SERVICE

BUT THERE IS ONLY ONE MUD LINE VALVE

CAMERON FLEX-SEAL

A Cameron "Flex-Seal" Mud Line Valve in closed position. Note how the gate seats in the resilient flow-way insert.

There's no other valve like a Cameron "Flex-Seal" for, unlike ordinary gate valves and stop cocks which were designed for a number of services, "Flex-Seals" were designed expressly for use on lines handling abrasive fluids: drilling mud, cement slurry, etc. The cutting action of these fluids is absorbed by a resilient rubber flow-way insert which, after long service, may be quickly and easily replaced by the drilling crew. No special tools are required and the new insert costs only a few dollars.

Available in 1000, 2000, 3000 and 5000 lb. working pressure models, and in full range of sizes up to 4-inch. See your Composite Catalog for complete mechanical details or descriptive literature will gladly be sent on request.

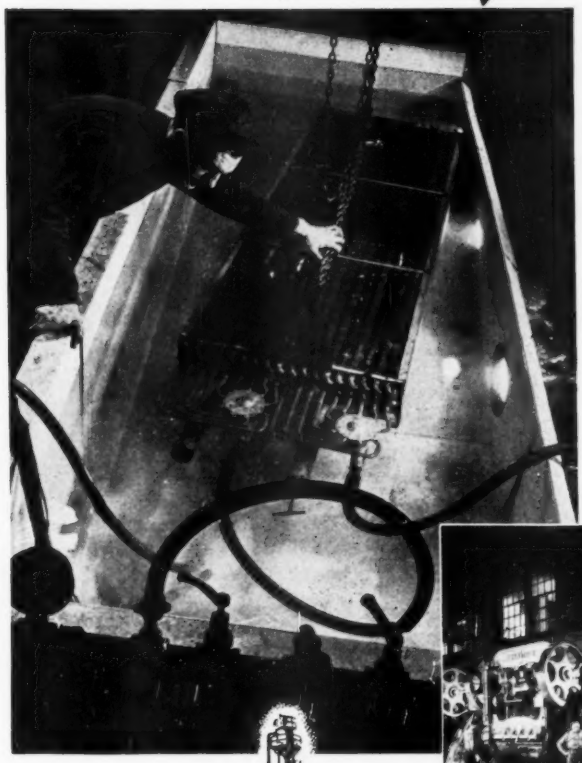
Cameron

IRON WORKS INC.

P. O. BOX 1212 HOUSTON, TEXAS

Export: 74 Trinity Place, New York, N. Y. Oklahoma: 310 Thompson Bldg., Tulsa (Telephone 28970). California: Long Beach (P. O. Box 267). Wyoming: P. O. Box 709, Casper (Telephone 1577). North Louisiana: Bossier City (P. O. Box 425). Texas: Odessa, P. O. Box 431 (Telephone 3112); Corpus Christi (Telephone 28783), Forth Worth (Telephone 46522).

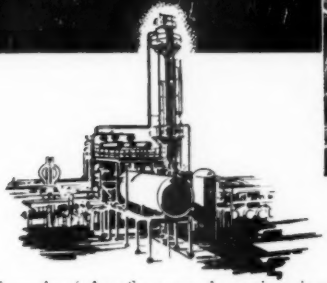
Here's the Story ON AEROFIN...

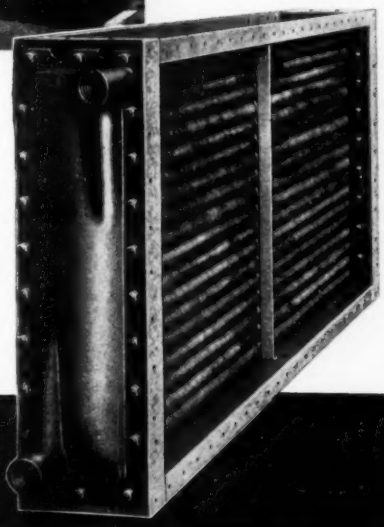


This man is completing one of the many tests used to control the quality of Aerofin finned heat-transfer surface. He is looking for air bubbles in a specially illuminated tank. If there are no bubbles, it means the immersed Aerofin unit has withstood the terrific strains of steam and hydrostatic pressure tests and is ready to give you long, efficient service.

Such rigid specifications and inspection, backed up with over 25 years of experience in manufacturing finned heat-transfer surface, assures you of Aerofin dependability, durability and maximum efficiency.

Aerofin is devoted exclusively to the production of finned heat-transfer surface. This specialization enables Aerofin engineers to select just the right surface and materials for the job, enables expert workmen to assemble these materials into a highly efficient unit.





The end result of Aerofin research, engineering and specialized production is the Aerofin Finned Heat-Transfer Unit. Day after day, thousands of units like this one demonstrate their superiority under the most severe conditions. Complete research and accurate ratings allow you to install Aerofin at full rating with confidence. You can depend on Aerofin to give you long, efficient service.

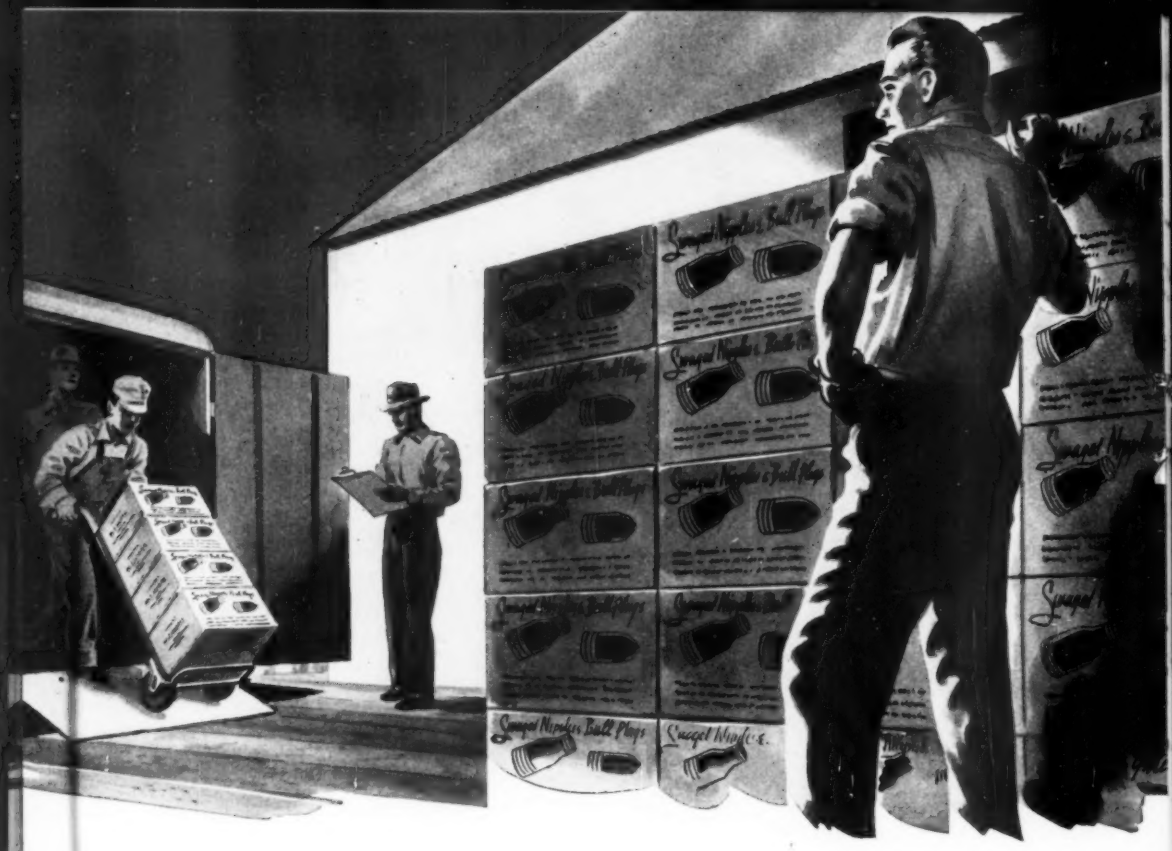
Throughout the Petroleum Industry—

Aerofin units do the job Better, Faster, Cheaper

AEROFIN CORPORATION

410 South Geddes St., Syracuse 1, N. Y.

NEW YORK CHICAGO CLEVELAND DETROIT
PHILADELPHIA DALLAS MONTREAL



Supply Men know that . . .

Norris Fittings are *"ROLLING STOCK"*

The popularity of any product can best be learned from the men who sell it. Ask the supply men at your store about NORRIS Fittings.

Strength, perfect threading and NORRISIZING are the reasons why NORRIS Swaged Nipples and Bull Plugs are in use wherever oil is produced. These Threaded Fittings and NORRIS Welding Caps and Reducers are backed by our reputation for Quality Products. Made only from the finest seamless steel tubing, all NORRIS Fittings are precision built — field proven.

For additional information about NORRIS fittings write for Bulletin No. 31-A.

W.C. NORRIS, MANUFACTURER, INC.

TULSA, OKLAHOMA

BRANCHES:
HOUSTON, KILGORE, ODESSA, TEXAS;
SALEM, ILLINOIS; CASPER, WYOMING

EXPORT: 30 ROCKEFELLER PLAZA, NEW YORK CITY

Since QUALITY NORRIS PRODUCTS 1882

WEST COAST DISTRIBUTORS:
REPUBLIC SUPPLY COMPANY OF CALIFORNIA,
Los Angeles

Published every Thursday by The Petroleum Publishing Co., 211 S. Cheyenne, Tulsa, Okla.

P. C. LAUINGER
President

S. H. ROURKE
Business Manager

HANSON B. PIGMAN
Circulation Manager

ADVERTISING
MITCHELL TUCKER
Manager

Houston Office
Sterling Building, Phone Charter 4-4626
WAYNE RIVES
Vice President, Gulf Coast Sales
JOHN M. SPEARS
Representative

New York Office
415 Lexington Ave., Phone Murray Hill 2-4731
CHARLES A. WARDLEY
Eastern Manager
ROBERT N. CAIRD, JR.
Representative

Chicago Office
105 West Madison, Phone Central 6-2537
C. R. FARMER
Manager
E. S. KLAPPENBACH
Representative

Pittsburgh Office
429 Fourth Ave., Phone Atlantic 4835
ALFRED M. JONES
Manager

Tulsa Office
211 S. Cheyenne, Phone 3-6291
JOHN D. REILLY
Mid-Continent Manager
J. PARKER HOLLAND
Production Manager

Los Angeles Office
650 S. Grand Ave., Phone Vandike 0722
DONALD O. HANSON
Manager

England Office
111 Thorley Lane, Timperley, Cheshire
HARRY S. BECKER
European Representative

Member
Audit Bureau of Circulations
Associated Business Papers

JOURNALLY Speaking

Seeing Oil

OUR geophysical advertisers will probably hate us for mentioning this, but they are going to be up against a new kind of competition this summer. However, if we didn't spill the beans somebody else would, so here goes:

According to an announcement from the Information Office of the Government of the Union of South Africa, Pieter van Jaarsveld, the "Boy with the X-ray Eyes," has signed a contract with a company in Denver, Colo., to visit the United States "to divine new sources of oil."

Maybe you read about Pieter in a recent issue of a popular picture magazine, which said he could locate water or gold simply by looking at—or through—the surface of the land. As we recall it, the write-up didn't claim he had made successful wildcat locations in the as yet oil-less Dark Continent, though mining and irrigation projects were bidding high for his services.

That rumbling noise you hear is the geological profession quaking in its boots. It has just got the hard-headed, scientifically minded American public disabused of the idea that oil could be found with doodle bugs and peach twigs when along comes this new threat. If Pieter is so hot, why doesn't he stay in Africa where they need some oil instead of coming over here where our own methods have already discovered so much oil it's running out of our ears?

Running Out?

TWO weeks ago the Journal's editors presented a hefty report on the Rocky Mountain and Western Canada regions in which they professed to see great possibilities for future oil production.

In this issue Dave Stormont, who radiates from his base in Dallas, tells about the excitement in Scurry County, which he says is probably the most important discovery in West Texas in recent years.

And our L. A. editor, Bob Harwick, gives the low-down on developments in Cuyama Valley, which still has California oil men on the edge of their chairs.

Where is that guy who kept saying we were running out of oil? Seems like he's been rather quiet lately.

Hope Springs Eternal

ONE thing Dave overlooked in his report on Scurry County, complete as it is in other respects, is that a dry hole just completed there was financed by comedians Bing Crosby and Bob Hope. However, Bing and Bob are said to constitute the "et al" in a well drilling in Harris County, so there's still hope in Texas.

The Dutch Company

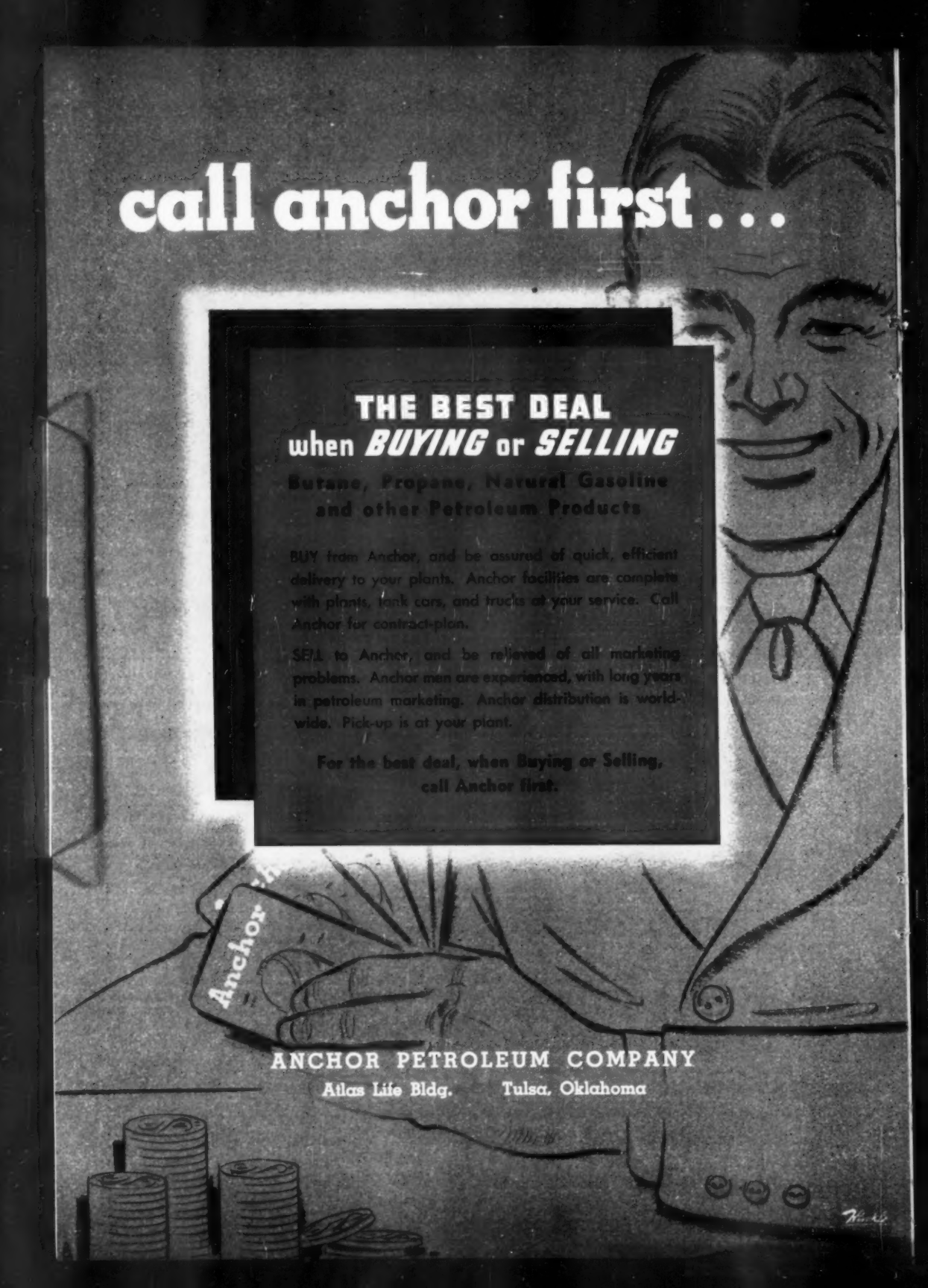
IT is with a certain sadness that we note that the Royal Dutch Company for the Working of Oil Wells in the Netherlands Indies, Ltd., is changing its name to just plain Royal Dutch Petroleum Co.

The traditional journalistic dislike of any name too long to fit into a headline didn't apply in this case because shortened forms were in universal use. And we can understand how the new name is more in keeping with the modern tempo of business, the world-wide nature of the company's activities, and the enlightened policy of the Netherlands toward the sensibilities of the Indonesians.

But there was something about that ponderous name that caught our fancy. It had a venerable dignity, an aura of classic gentility like the musty oaken beams of a Shakespearean tavern. It conjured up visions of frock-coated gentlemen, quill pens, and sailing ships, though actually the company was not incorporated until 1890.

But times change, and the fast-moving oil business has little place for nostalgia. Incidentally, we wonder what company now succeeds to the honor of having the longest firm name in the oil industry.

—Henry D. Ralph


call anchor first . . .
THE BEST DEAL
when BUYING or SELLING
Butane, Propane, Natural Gasoline
and other Petroleum Products
BUY from Anchor, and be assured of quick, efficient delivery to your plants. Anchor facilities are complete with plants, tank cars, and trucks at your service. Call Anchor for contract-plan.
SELL to Anchor, and be relieved of all marketing problems. Anchor men are experienced, with long years in petroleum marketing. Anchor distribution is world-wide. Pick-up is at your plant.
For the best deal, when Buying or Selling, call Anchor first.
Anchor
ANCHOR PETROLEUM COMPANY
Atlas Life Bldg. Tulsa, Oklahoma

the OIL AND GAS JOURNAL

FOUNDED IN 1910 BY PATRICK C. BOYLE

VOL. 48, NO. 9 JULY 7, 1949

EDITORIAL STAFF

C. O. WILLSON
Editor

Kenneth B. Barnes — Engineering Editor
Henry D. Ralph — News Editor
George H. Weber — Refining Editor
415 Lexington Avenue, New York City
Paul Reed — Pipe Line Editor
W. L. Nelson — Technical Editor
Lynn M. Nichols — Associate Editor
Neil Williams — Associate Editor
Charles J. Deegan — Associate Editor
R. B. Tuttle — Associate Editor
C. Dudley Johnston — Staff Artist

DISTRICT EDITORS

Dahl M. Duff — 415 Lexington, New York City
Ted A. Armstrong — 211 S. Cheyenne, Tulsa
Roy F. Carlson — 211 S. Cheyenne, Tulsa
John C. Casper — 211 S. Cheyenne, Tulsa
Robert Harwick — 650 S. Grand, Los Angeles
Carl F. Hoot — Mercantile Bank Bldg., Dallas
Victor Lauriston — 35 Stanley Ave., Chatham, Ont.
Bertram F. Linz — 621 Albee Bldg., Washington
Leigh S. McCaslin — Sterling Bldg., Houston
John C. Reidel — 211 S. Cheyenne, Tulsa
William P. Sterne — 211 S. Cheyenne, Tulsa
D. H. Stormont — Mercantile Bank Bldg., Dallas
Polly DeArmond — Editorial Assistant, Tulsa

CORRESPONDENTS AT

Denver, Colo. — Calgary, Alta.
Pittsburgh, Pa. — Ashland, Ky.
Columbus, Ohio — Oil City, Pa.
Mount Pleasant, Mich.

Subscription rate to the petroleum industry, United States and foreign, 1 year, $3.00. Single copies, 50 cents. Back copies when over a year old, one dollar. Note: Payments from outside the U.S.A. may be in the form of an international money order or check on a U.S.A. bank. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1949 by The Petroleum Publishing Co.

In This Issue

News

Canadian Interests Planning Gas Pipe Line From South Louisiana 36
Gasoline Prices Are Criticized and Upheld at Senate Hearing 37
Senator Urges Work Start at Once on Model Synthetic Fuels Plants 38
Domestic Opposition Continues on Proposed Mexican Loan 40
Tidelands Again Stalemated as Krug Rejects Compromise Plan 41
Mileage Record Broken in Economy Marathon 41
New Consulting Firm Becoming Active in Latin American Work 42
Refinery at Cardon May Reach 90,000-Bbl. Rate 42
Phillips Completes Second B-1 Field Well, Rated at 1,400 Bbl. 43
Higher Crude Imports, Reliance on Middle East Is British Trend 44
Argentine-British Trade Pact Imposes Problems on Refiners 46
U. S. May Demand End of Argentine Treaty If Conditions Improve 46

Engineering-Operating

Scurry County Limestone-Reef Development 54
Cuyama Valley Living Up to Expectations 58
Physical Properties, Analysis for Liquid Hydrocarbons 60
Raydist—Method of Surveying by Use of Radio Waves 69
Questions on Technology 72
West Poison Spider Drilling and Completion Problems 75
New Rocky Mountain Tank Battery 78
Flow Efficiency of a 30-In. Natural-Gas Line 81
Engineering Fundamentals—Rate of Capillary Displacement 93
Cost-imating—Refrigeration Plants 95
Oil and Gas Equipment Digest 97

Exploration-Development

Confirming Well for Forest City Basin a Success 115
Highlights of Week's Developments 115
Reports by Areas Start on Page 116

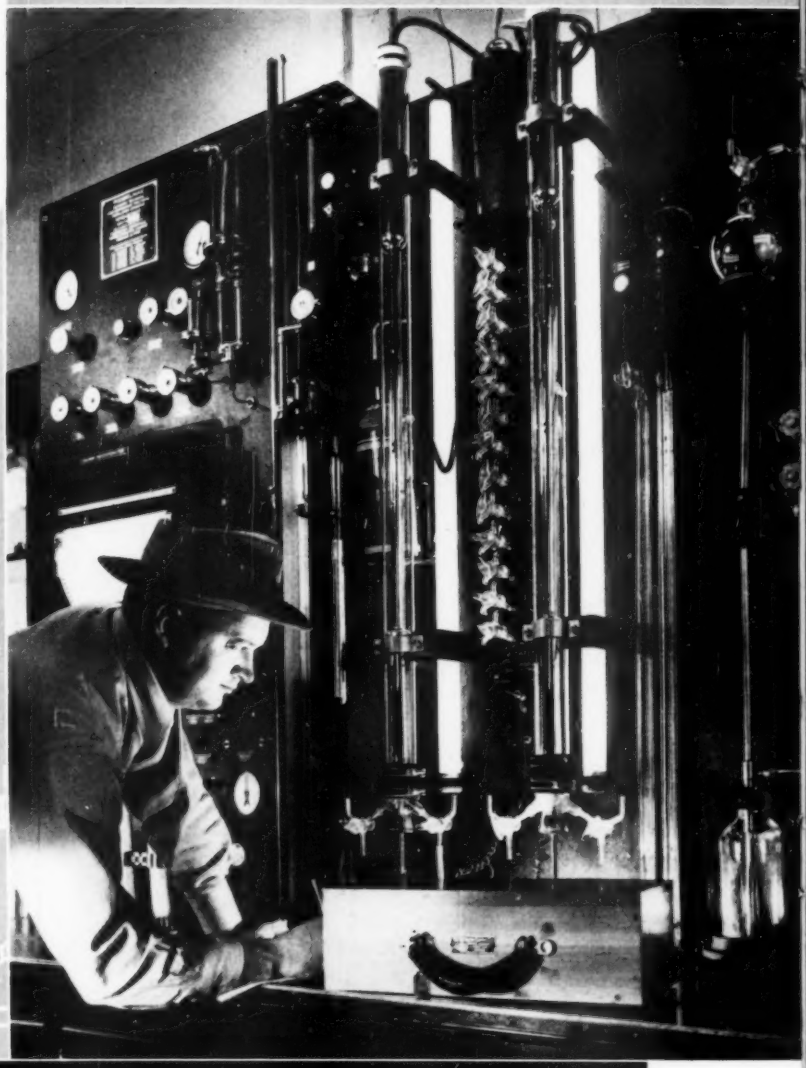
Departments

Journally Speaking 31
Editorial 35
This Week 39
International News 42
Watching Washington 47
Personals 49
Deaths in the Industry 53
Pipe-Line News 102
Natural-Gas News 107
Natural-Gasoline News 107
Refining News 108
Drilling Contractors 111
Exploration Statistics 134
Production Statistics 135
Refining Statistics 136
Market Statistics 137
Equipment Men in News 138
Classified Advertising 141
Calendar of Events 144
Advertisers' Index 144

7 Reasons WHY IT'S WARREN

1. PERSONNEL
2. EXPERIENCE
3. FACILITIES
4. PRODUCTION
5. STORAGE
6. TRANSPORTATION
7. RESEARCH

Complete and continuous research and testing by Warren's two Research Laboratories.



WARREN PETROLEUM CORPORATION

Producers, Manufacturers, Exporters and Marketers

Export Terminals: Corpus Christi, Port Arthur, Baytown, Texas City, and Norsworthy, Houston, Texas.

TULSA 2, OKLAHOMA CABLE ADDRESSES: Stavolene, Warren

Crude Oil, Natural Gasoline and Liquefied Petroleum Products

THE OIL AND GAS JOURNAL

Price of Gasoline

THE Washington oil investigators are recovering from the blow they received last year when the threatened shortages in oil supplies ended. It will be recalled that several legislative committees and departmental heads thought that at last they had the oil industry with its back against the wall and were confident that they would be able to extend government controls in several directions.

When the supplies became adequate, as oil spokesmen said they would if the industry was left alone to solve its postwar problems, the proponents of government controls obviously felt let down and for the moment with no place to go.

But investigators are resourceful individuals, and after several months of confusion and indecision, the trek of operators back to Washington was resumed, the latest being at the behest of the Senate's subcommittee on small business. The excuse is gasoline prices.

The subcommittee does not explain why a product of the oil industry was singled out for an investigation. It knows that while gasoline prices to consumers have only advanced 39 per cent over the 1935-1939 level, the cost-of-living index shows an increase of 70 per cent.

The oil industry has never sought to rest its case on comparisons with other enterprises, but it would be enlightening not only to the oil business but to millions of citizens why legislative searchers of facts have not included products which take far more of the consumer's dollar than does gasoline. As millions of consumers have indicated, it would be interesting, as a matter of public policy, to know the why of farm-product prices—potatoes for example. We are assuming, of course, that political expediency never enters into decisions as to what should be investigated and what should not be.

Recent gasoline trends can be briefly summarized. During 1946-1948, owing to the heavy demands for the intermediates—kerosine, distillate, and gas oil—and residual fuel oil, these products bore a greater than normal percentage of refinery realization. These, rather than gasoline, absorbed most of the 1947 increases in crude-oil posted schedules, and refinery yields were adjusted accordingly.

Now the normal price relationships between the products is returning. Intermediate and residual prices are lower, the reductions in heavy fuels totaling from 25 to more than 50 per cent.

Motor-fuel quotations, which have been low in relation to crude-oil prices, were advanced in some areas to offset in part the decline in realization from other products. Trends later will depend entirely on what happens in the supply-demand relationship after this postwar adjustment period has been completed. In the meanwhile, unbiased investigators will find that gasoline prices are fair regardless of the test applied.

Canadian Interests Planning Big Gas Pipe Line From Southern Louisiana

by Leigh S. McCaslin, Jr.

HOUSTON.—Final arrangements are now being made for launching a natural-gas pipe-line project from coastal Louisiana to an undisclosed northeastern destination which, if carried out according to present plans, would be one of the biggest gas transmission operations in the world, it was learned reliably this week.

The backer of the project is American Gas Transit Corp., Ltd., a Canadian firm. Present plans call for a line 1,300 miles long, 30-in. in diameter, engineered to carry gas at a working pressure of 1,000 psi., and to cost $300,000,000.

Thus the length, diameter, pressure, and cost would all place it among the very largest of gas pipe lines.

Considerable mystery surrounds the project, and rumors of it have been heard for more than a year. Alexander Crowell, consulting engineer of Shreveport and New Orleans, has been working on it for the past 18 months, and is currently assisting in negotiating contracts for the purchase of gas.

Within the past 2 weeks the law firm of Chill, Landman & Gordon, of Jackson, Miss., and Washington, D. C., has sent letters to owners of uncommitted or uncontracted natural gas in southern and coastal Louisiana soliciting proposals for the sale of gas for the line. The letters state that the buyer desires 6 trillion cubic feet of gas at the rate of 500,000,000 cu. ft. daily—a 33-year supply.

To Start Near Baton Rouge

The origin of the line it is understood, will be in Krotz Springs field of St. Landry Parish, Louisiana, about 40 miles east of Baton Rouge. Most of the reports have indicated that the line would run to Chicago. However, if it is to be 1,300 miles long it would extend considerably farther north or east than that. Such a distance would take it into New England, or northern Minnesota, or to some place on the arc between these points, such as the populous areas of the Great Lakes region of the United States or Canada.

Canadian capital is said to be back of the company, and it is reported that there will be no public offering of stocks or bonds. Plans are believed to have progressed to the point where market outlets for the gas are secure, pipe for the line is on order, right-of-way is being purchased, and financial arrangements completed. It is also reported that to date agents of the company have made arrangements for one-third of the desired 6 trillion cubic feet of gas reserves.

Directors of American Gas Transit Corp. met in Shreveport June 13 and are meeting in New York this week, which suggests that preliminary plans are nearing completion. Crowell also left for New York last week and expects to be there the rest of the summer. A large New York engineering firm has been retained to work on the design and construction details of the line, according to information here.

Crowell also announced this week that he has completed a study of the reserves and availability of natural gas in southern and coastal Louisiana, both on land and offshore, based on records of the state Department of Conservation and information supplied by owners of gas reserves. He estimates that 20 trillion cubic feet of gas is available from the 640 wells in the area, and that 52 per cent of these wells are unconnected, though the volume of gas uncommitted is not known.

Offers Made for Gas

Agents of the new company are said to be offering 10 cents per 1,000 cu. ft. for gas, which is higher than field price usually prevailing. This price is based on a 15.025 psi. gage pressure base and 60° F. Also, the gas will be measured according to Boyle's Law for the measurement of gas under varying pressures with corrections for deviations therefrom. The purchaser is asking for a delivered pressure of 750 psi.

The common pressure base for purchased gas in Louisiana is 16.7 psi. at 60° F. with no correction for deviations from Boyle's Law. Hence, the 10 cents per thousand being offered would be approximately 12 cents if figured on the same basis as most gas now being bought in the state.

An interesting sidelight on the proposed line is the rumor in Houston that Gulf of Mexico operators are in the "talking stage" on a community offshore gas-gathering system. A number of gas and gas-condensate discoveries in the Gulf have been shut in for lack of outlet. In addition, of course, considerable gas is being produced in the tidelands oil fields along with the oil. Operators with offshore production, and hence presumably interested in such a project include: Magnolia Petroleum Co., Humble Oil & Refining Co., Kerr-McGee Oil Industries, Inc., Phillips Petroleum Co., Stanolind Oil & Gas Co., Superior Oil Co., Barnsdall Oil Co., Seaboard Oil Co., The California Co., Callery & Hurt, and Shell Oil Co., Inc. If the community gas-gathering project should go through, the proposed American Gas Transit Corp. line would offer a logical outlet.

Standard Measurement of Gas Arbitrary in Texas

AUSTIN. — Standard measurement of all natural gas produced in Texas is now arbitrary under a bill signed by Gov. Beauford H. Jester.

In signing the bill, the governor expressed the hope that "this standard may be recognized soon in other oil and gas-producing states and become the accepted standard over the nation." Guy I. Warren, Corpus Christi independent and president of the Texas Independent Producers and Royalty Owners Association, commented that "this law is unquestionably in the best interest of the general public. As all three members of the Texas Railroad Commission have announced, its effect will be to bring about an accurate, fair, and honest measurement of all the gas produced."

The new law requires that all gas sold be measured at a standard pressure base of 14.65 psi. and 60° F. temperature. It is provided that the Railroad Commission is to determine the average temperatures and other factors of gas in all the oil and gas fields of the state. A defense against penalty for violating the act is provided in case the commission has not published its findings on the field in question.

Half Interest in Holzmark Leases Bought by Shefts

HOUSTON.—Irving Shefts of Mim Oil Co., San Antonio, is reported to have purchased Chass Production Co.'s half interest in the Holzmark leases, Holzmark field area, Bee County, Texas.

Involved in the sale are eight oil wells with a daily production of 165 bbl., one well now being completed, and 1,500 acres of leases. The property will be operated jointly by Shefts and Siznod Oil Co.

Gasoline Prices Are Criticized And Upheld at Senate Hearing

by Bertram F. Linz

WASHINGTON.—Profits of the major oil companies must be figured on a basis of the entire barrel of crude and not on one individual product, A. L. Nickerson, director of domestic marketing of Socony-Vacuum Oil Co., told the Senate banking committee June 29 at a preliminary hearing on gasoline prices.

A mild winter which backed up the flow of fuels oils and expanded the demand for gasoline brought about the unsettled situation which necessitated last April's gasoline-price increase, Nickerson explained.

Bringing the discussion down to an earthy basis, Nickerson compared an oil company with a butcher.

"Even with some elasticity in refinery yields," he said, "nevertheless gasoline cannot be produced without at the same time making large volumes of fuel oil. With fuel-oil storage filled to abnormally high levels for winter time and fuel-oil prices softening and gasoline demand firm, we had to realize more for gasoline to help cover the undiminished cost of a barrel of products.

Follows Demand Changes

"The situation is much the same as that which confronts operators in other fields where many products are produced from a single raw material. For example, the butcher, buying an entire beef carcass, has to get from the sum total of the several products enough to pay for the cost of the carcass, his own expenses, and obtain a profit; otherwise he goes out of business. If, from time to time, due to changing public demands or the competition of other foods, including other types of meat, he cannot get the price normally obtained for certain cuts of beef, he simply must, if he is to survive, recover more from those cuts which are in demand."

Nickerson was the last of a group of witnesses called by the committee and the only representative of the production end of the industry. The only other industry witness was W. L. Heinz, Columbia, S. C., petroleum wholesaler and secretary-treasurer of the South Carolina Oil Jobbers Association.

Heinz testified that the jobbers are "greatly confused" by the increase in gasoline prices and the "trend toward economic concentration." The independent jobbers, he said, do not participate in the large profits of the industry and are threatened with elimination, which would leave the field to "monopoly competition."

The producing states, Heinz charged, are controlling production to support prices, as evidenced by the fact that while prices for Pennsylvania crude, not under conservation control, have dropped from $5 to $3.27, the prices of crude in the conservation states have not declined.

As the hearing got under way, Sen. Charles W. Tobey of New Hampshire, ranking minority member and chairman during the last Congress, asked Chairman Burnet Maybank of South Carolina whether the investigation was going to be "one of those things" handled with kid gloves "or are we going to get down to the guts of it?"

Tobey said the oil companies are the most efficient operators in the world, and paid tribute to the way in which they cooperated in 1947-48 in his efforts to insure the equitable distribution of supplies, but said there is another side to the picture which should be developed.

Sen. Homer E. Capehart of Indiana also participated extensively in the questioning of Heinz, and after the latter had admitted that there is a surplus of crude, even with the cutbacks in production that have been made, suggested he saw nothing wrong, asking "isn't it the philosophy of the Government at the moment to control surpluses by controlling production?"

Capehart, however, hammered hard at the Interstate Oil Compact, which Heinz said made it possible for some 9 or 10 states to control the nation's crude supply, and Sen. John J. Sparkman of Alabama cut in at one point to argue that if the price of crude has remained steady while the price of gasoline increased there is no guarantee that gasoline prices would be reduced if the price of crude comes down.

Tanker Practices Attacked

Three other witnesses also took the opportunity to shoot at the industry. Hoyt S. Haddock, executive secretary of the C.I.O. Maritime Committee, charged that some 40,000 seamen have been thrown out of work since the end of the war and the American merchant marine greatly weakened "because the oil companies are transferring more and more of their tankers to foreign flags, notably that of Panama."

"The oil companies claim that the transfers are necessary to meet competition," Haddock declared. "Yet, despite the lower costs obtained by evading American labor standards and avoiding American taxes, the oil companies, as this committee knows, have been fleecing the American consumer."

Haddock asserted that after the end of the war, when the Maritime Commission set a freight rate of $2.85 per long ton from Gulf to North Atlantic ports for its tankers, oil-company officials testifying before congressional committees said the rate

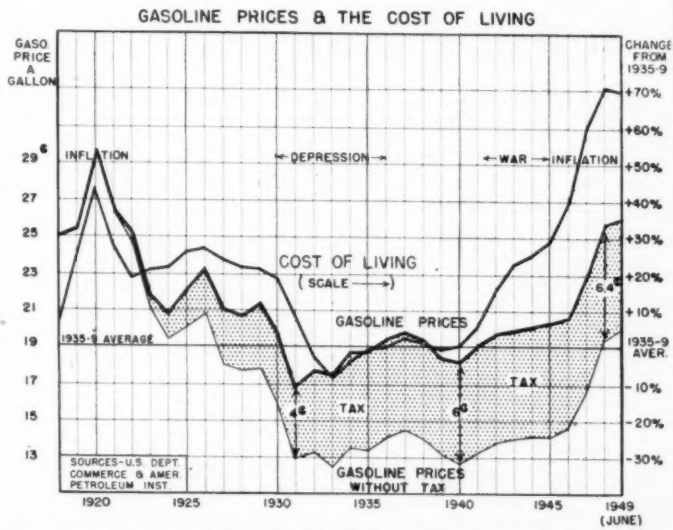


Chart presented to the Senate committee by A. L. Nickerson in connection with his testimony that the price of gasoline is not out of line with the prices of other commodities

was too high and lower fuel-oil and gasoline prices could be had if tanker rates came down. But, he said, the rates now are running as much as 50 per cent under the postwar figure but there has been no reduction in prices.

Haddock suggested that the committee study the profits of the foreign affiliates of the major companies and the tactics used to bring the earnings into this country with the payment of a minimum of taxes by withholding remittances in periods of high rates.

The committee also heard charges that gasoline prices have been increased more in states with high gasoline taxes than in low-tax states, regardless of whether they are producing states.

Laurence Reuben of the Michigan Good Roads Federation told the committee that surveys covering the period from January 1, 1946, to July 1, 1948, showed that in 12 states which increased their gasoline taxes, gasoline prices increased by an average of 4.53 cents per gallon while in states where the taxes remained unchanged the average increase was 5.61 cents.

"This can only mean that all the states are the petroleum industry's market," Reuben said. "That industry must make a profit. If the tax is so high in one state that it threatens the consumption of gasoline to a point where the profit will disappear then that price must be adjusted and the difference made up by the motorists in those states wherein the tax is low. This is an unfortunate situation for the people of Michigan where continued highway development is the key to our state's progress."

Nickerson, however, contended that while customers may be paying more for gasoline they have enjoyed a reduction on their oil purchases as a whole, and gasoline prices themselves have increased only 39 per cent over the prewar level while the cost of living is up 70 per cent.

Today, Nickerson said, "Socony-Vacuum customers are paying 1.26 cents per gallon more for gasoline than a year ago, but 1.5 cents less for kerosine, 1.5 cents less for No. 2 heating oil, and 2.75 cents less for fuel oil, which adds up to an annual rate of $14,318,000 for the company's customers on the East Coast alone.

Nickerson declared that the postwar history of the oil industry is "a classic example of the function of price in the operation of the law of supply and demand in a free-enterprise economy.

"The cycle began with a period of relative product stringency after the war that brought with it a series of price increases," he explained. "The price increases stimulated a period of intense activity at all levels of the industry but notably at the crude-production level. This activity resulted in increases in the supply of material to the extent that stocks were replenished and supply became ample in most product categories. The last phase ensues—the one we now find ourselves in—prices are declining and bringing profits down with them. We are fortunate indeed to live in a country with an economy still relatively unfettered."

Senator Urges Work Start at Once On Model Synthetic Fuels Plants

WASHINGTON.—Stressing the impossibility of building a large-scale synthetic liquid-fuels industry during an emergency, Sen. Harley M. Kilgore of West Virginia last week urged immediate enactment of the administration's bill to build three or more commercial-size plants for the conversion of oil shale and coal.

Kilgore prepared a lengthy report on the experimental work of the Bureau of Mines which, he said, has demonstrated that gasoline and oils can now be produced competitively from both materials, and declared the construction of plants should not be deterred by fears of obsolescence by reason of further improvements which may be made on synthesis processes.

Even if construction was authorized today, he pointed out, it would take a year or more to complete the design and engineering, and any improvements developed during that period could be incorporated in the final designs, but aside from that, approximately 80 per cent of the equipment required for synthetic-fuel plants is of a more or less standard nature and would not be changed by process improvements.

Kilgore warned that our petroleum reserves are "not unlimited," but made no attempt to predict the date when we would have to shift to synthetics. However, he emphasized, only if immediate steps are taken to establish the initial commercial plants will we be able to retain our fuel self-sufficiency when our domestic oil production begins to wane.

"A synthetic fuels industry of adequate proportions hardly can be built during an emergency, if we have to start from scratch," Kilgore asserted. "Instead, as in other basic industries, the pioneer commercial units first must be established to serve as a foundation on which to build—and on which to expand rapidly if necessary. To delay this first difficult, time-consuming step—the construction of the initial plants — may well jeopardize this nation's welfare.

"These model plants should be built and operated by private industry. If necessary, financial assistance should be provided by the Reconstruction Finance Corp. to overcome any reluctance on the part of industry to undertake plant construction with the competition of petroleum prevailing."

Exception to Stop-Flare Order Sought by Shell

An exception to the Texas Railroad Commission's stop-flaring order regarding casing-head gas has been asked by Shell Oil Co., Inc., in Fullerton field. If granted, the exception would apply to the firm's 1-C Scarbrough well.

Request was based on contention the well does not produce enough casing-head gas to make connection to a gas-gathering line economically feasible. Engineers state that the well, on the edge of the field, makes 24 bbl. of oil and 24,000 cu. ft. of gas daily. Of this gas, 8,000 cu. ft. was used for fuel and 16,000 ft. was flared. Life expectancy of the well has been set at April 1951.

To connect the well to a nearby gathering line would cost $2,945, the company stated, and at the rate of 16,000 cu. ft. of gas a day it would take 10 years to pay for the line.

Four More Oil Firms Ask Offshore Lease Suspension

BATON ROUGE. — Four additional law suits have been filed in district court to suspend the obligations and extend the rights of leaseholders in Louisiana's tidelands area until the state-federal dispute is settled.

Earlier, eight suits were filed by major companies holding leases in the Gulf. The new suits affect a total of 91 leases. One suit was filed jointly by Continental Oil Co., Cities Service Oil Co., Tide Water Associated Oil Co., and Atlantic Refining Co. (the Continental Combine). Another joint suit was filed by Pan American Producing Co. and Seaboard Oil Co. of Delaware. A third suit was filed by Superior Oil Co., and the last by Superior in conjunction with J. R. McDermott & Co., Inc.

Kansas Allowable for July Is Cut 30,000 Bbl. Daily

The Kansas Corporation Commission has set the maximum crude-oil allowable for the state during July at 245,000 bbl. daily, a cut of 30,000 bbl. daily from the previous 3 months.

In April, May, and June the allowed production was 275,000 bbl. daily. During the latter part of 1948 it was set by the conservation commission at 300,000 bbl. daily.

this week

WASHINGTON—Senate committee investigates gasoline prices. . . . Socony-Vacuum official testifies recent increase was necessary and oil prices still below general commodity level. . . . ¶Federal officials reject proposed compromise of state claims to offshore oil. . . . Another compromise being attempted, but tidelands issue appears still stalemated. . . . ¶Senator urges immediate construction of pilot plants for synthetic fuels. . . .

FOREIGN RELATIONS—Domestic interests continue to oppose government loan to Mexico for oil development. . . . ¶United States may ask abrogation of Argentine-U. K. treaty if currency exchange conditions improve. . . . ¶Government officials doing preliminary work on "Point Four" program of financial aid to foreign economic development. . . . ¶Trade agreements law expires, but more traffic bargaining proposals may come up next year. . . .

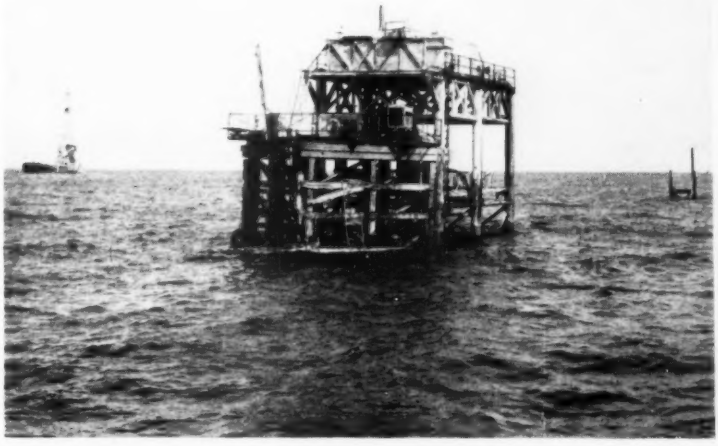
TRENDS—Refinery production of gasoline for 4 weeks in June was 1.4 per cent greater than in the same weeks last year. . . . Refinery runs for the same period were 7.5 per cent lower than last year. . . . Total gasoline stocks were reduced at the rate of 177,000 bbl. daily compared with 107,000 bbl. per day in previous year's period. . . . If last year's yields had been applied to this year's reduced runs, the required reduction in gasoline stocks would have been about 400,000 bbl. daily. . . . Actual domestic demand in June of last year was only 1.0 per cent less than in July and was 0.3 per cent greater than in August. . . .

NATURAL GAS—Canadian capital revealed to be behind project for natural-gas pipe line from Louisiana to undisclosed destination 1,300 miles to the northeast. . . . Would be one of biggest lines in the world in several respects. . . . ¶New York City area to get first natural gas around August 1 when New York & Richmond Gas Co. introduces the fuel in its Staten Island system. . . .

INTERNATIONAL—Britain's economy heading toward heavy reliance on Middle East oil. . . . Study shows United States will be relegated to supplier of petroleum specialties. . . . ¶Argentine refineries may suffer from new treaty with United Kingdom. . . . Plants not equipped to handle the sour crude British firms will supply from Middle East. . . . ¶Phillips discovery in Venezuela looks like promising field. . . . ¶Italian enthusiasm over Po Valley discovery cooled by further study. . . . ¶Shell's Cardon refinery in Venezuela will have ultimate capacity of 90,000 bbl. daily. . . .

REFINING—M.E.K. solvent dewaxing unit placed on stream at Sinclair Refining Co.'s East Chicago, Ind., plant. . . . ¶Gulf Refining Co. modernizing catalytic cracking unit at Port Arthur refinery. . . . ¶British American Oil Co. to increase refining capacity in western Canada.

PIPE LINES—Salt Lake Pipe Line Co. calls for construction bids on initial portion of 560-mile oil-products pipe line from Salt Lake City into the Northwest. . . . ¶Permit asked by Montana-Dakota utilities to construct $8,419,880 pipe-line project to increase availability of natural gas to customers in Montana and North and South Dakota. . . . ¶Southern Natural Gas Co. seeking authority to construct natural-gas transmission facilities to increase capacity of two of its main lines. . . .



The first offshore pipe line in the Gulf of Mexico originates on this platform in Bay Marchand field, 4 miles off the shore of Lafourche Parish, Louisiana. This platform, where the discovery well was drilled in the middle of the salt dome, is being enlarged to accommodate stock tanks, separators, pumps, gager's house, and other equipment. In the background is another platform from which two producers have been brought in and a third is drilling. This project of The California Co. will be described in detail in an early issue of the Journal

Domestic Opposition Continues On Proposed Mexican Oil Loan

WASHINGTON.—Opposition to the proposal that United States Government make a loan to Mexico for oil development continues to reach Washington, the latest protest made public being that of Frank M. Porter, president of the Mid-Continent Oil and Gas Association, who wrote the State Department that "the operations of the nationalized oil industry of Mexico do not indicate that financial assistance would result advantageously to either the United States or Mexico."

Department officials are studying the loan proposal, and have invited comments from interested parties.

Porter's protest, addressed to Robert H. S. Eakens, chief of the department's petroleum division, followed a similar letter written by Max W. Ball, former director of the Oil and Gas Division. The letters, apparently, were only two of a large number received in the department, together with formal resolutions of trade associations, such as that of the Kentucky Oil and Gas Association, adopted at a meeting in Lexington, Ky., June 24, which held that a loan to Mexico might result in overproduction in that country "which might have disastrous consequences" to domestic producers.

Has not Kept Pace

Porter pointed out that, when it expropriated foreign oil properties in 1938, Mexico took over "a well-organized, prosperous industry which, under proper management, was capable of generating surplus capital sufficient to meet the necessary expansion to supply the Mexican economy," yet, although compensation for the properties was only a fraction of their appraised dollar value, Pemex has thus far failed to show a profit, there has been little new development, and the industry has failed to keep pace with other areas of the Western Hemisphere where private ownership prevails and the use of private capital is permitted.

"The operations of the nationalized oil industry of Mexico do not indicate that financial assistance by this government to Mexico would result advantageously to either the United States or Mexico," Porter declared. "The suggestion that the loan, if made, should be subject to the condition that it not be used for oil development means nothing because any loan will merely relieve other Mexican funds that will then be available for oil development.

"Second, it is assumed that any loan to Mexico must be justified on the grounds that it will develop new sources of petroleum supplies, will strengthen both our domestic and hemispheric economy, and furnish a backlog for war, should that emergency develop. It is believed, however, that a loan under existing conditions would have a depressing effect upon the continued vigorous exploration for crude reserves in the United States. Government competition, whether by our own Government or neighboring governments, is a threat to the continued expansion of private business."

On the other hand, Porter continued, Canada offers particularly attractive opportunities, and if there is any doubt as to the ability of the domestic industry adequately to supply domestic commercial and military requirements "certainly Canada furnishes a more immediate and acceptable auxiliary source of supply outside the United States than the possibilities offered by Mexico."

Canada a Better Risk

"The stability of the Canadian Government and the prevailing attractive laws with respect to oil development by foreign interests are leading many Americans to invest large sums in that country," he said. "The Canadian development is an example of the results that flow from private ownership and use of private capital. It is difficult to understand why the American Government should use the public treasury for the development and operation of a nationalized industry that will retard the continued development of our domestic industry or impair the interests of our nationals abroad.

"If the Mexican Government is desirous of developing its natural resources, it is respectfully suggested that a stabilized government recognizing and guaranteeing the rights of private ownership will undoubtedly bring about results comparable with other countries where the use of private capital is rewarded with the right of private ownership."

Finally, said Porter, there is no foreseeable emergency that requires the immediate development of new reserves outside the United States. Domestic production has been cut by the state regulatory bodies to approximately 800,000 bbl. under the maximum efficient rate which, he emphasized, "means that the domestic industry has a producible reserve, based on maximum efficient rates, comparable to that enjoyed at the commencement of World War II."

"It is not suggested that the United States should assume the prerogative of prescribing the economic policy to be adopted by Mexico, but it is well within the province of this country to refrain from financing policies of a foreign country that have proved unsuccessful and completely out of harmony with the economic policy of this country," Porter concluded.

Louisiana Offers Leases On 96,809 Acres of Land

BATON ROUGE.—The state mineral board is offering for lease 96,809 acres of state lands in nine parishes with bids to be opened on July 28.

Biggest offering is 76,700 acres on Marsh Island off the coast of Iberia Parish. The island is a wildlife preserve administered by the Russell Sage Foundation. Marsh Island was leased in 1944 to Superior Oil Co. for a bonus in excess of $500,000 and one-fifth royalty. However, the mineral rights reverted to the state in 1947 because of lack of development.

No tidelands areas were offered for lease in view of the federal-state dispute now in progress. Leases included in the offering are in the following parishes: Caddo, Jefferson Davis, LaFourche, Plaquemines, Terrebonne, St. Mary, Iberia, Calcasieu, and Catahoula.

General American Oil Co. Buys Levelland Interest

General American Oil Co., Dallas, has purchased interest in 30 producing wells in Levelland field in West Hockley County, Texas, from H. E. Childs, Jr., Midland. Consideration was reported at approximately $750,000.

Childs owned some of the wells outright and part interests in some were involved with three different operators, E. Constantin, Jr., Dallas; Coronado Oil Co., Tulsa, and Yarborough & Phillips, Midland. These concerns will retain their interests in the partnership properties.

The wells produce from San Andres lime above 5,000 ft. Most are pumpers.

Humble Asks Injunction Against Shutdown Order

AUSTIN.—Humble Oil & Refining Co. has asked the Texas Supreme Court for a permanent injunction against the Railroad Commission's shutdown order for Tijerina-Canales-Blucher oil field in Kleberg and Jim Wells counties.

The field was ordered shut down last November, but Travis County District Court issued a temporary restraining order against the commission. However, this order was then dissolved by the Court of Civil Appeals.

Tidelands Again Stalemated as Krug Rejects Compromise Plan

WASHINGTON. — Negotiations between the states and the federal Government for a compromise of the tidelands issue reached a stalemate last week when Attorney General Tom C. Clark and Interior Secretary J. A. Krug turned down all suggestions that the Government share the management and revenues of the offshore lands with the states.

House Speaker Sam Rayburn of Texas met with the two Cabinet members for a discussion which left him highly discouraged and pessimistic over the possibilities of reaching any agreement.

Later, Rayburn met with Everett Mattoon, assistant attorney general of California; Bailey Walsh of Louisiana, and Walter Johnson, representing the attorney general's association.

Another conference is expected to be held this week. If it fails to develop any meeting ground for the states and the federal Government, it is probable the whole idea of a compromise will be dropped. In that situation, no effort would be made to get quitclaim legislation through Congress this session, since President Truman would be certain to veto it and the measure could not be passed over his objection.

May Wait on Court

The result probably would be that Congress would wait until the Supreme Court had acted on the suits filed against Texas and Louisiana, and then make one last effort to settle the matter in such way as to protect some, at least, of the states' tidelands interests. This would be more readily possible if the Government were to lose its suit against Texas because of the specific agreement under which it entered the Union.

Rayburn did not disclose the particular provisions of the proposed compromise which Clark and Krug refused to accept, but it is generally believed the deadlock occurred over the management of the tidelands, which the states sought to have left in their hands with respect to that area within their claimed seaward boundaries.

Krug has repeatedly indicated his belief that the Government should administer all of the submerged lands; Clark is reported opposed to leaving any compromise in the air for acceptance or rejection by the individual states.

The original proposals called for agreement by the federal Government that its paramount rights in the tidelands were limited to navigation, defense, and international relations; state control of the submerged lands with respect to oil development, taxation, and police powers; and a trade under which the Government would receive 37½ per cent of the oil income from the coastal areas and the states would receive a similar percentage from operations in the Continental Shelf.

The only point on which agreement could be reached has been a quitclaim by the federal Government to any rights to submerged inland areas. Legislation on that point has been introduced in Congress by the administration.

Mileage Record Broken In Economy Marathon

A FANTASTIC 149.95 miles per gallon was chalked up this year at the annual "Mileage Marathon," an unofficial automobile "race" conducted by personnel of the Wood River research laboratories of Shell Oil Co., Inc. Shattering the former record of 88.3 miles per gallon established in 1942, R. J. Greenshields, who is director of the laboratory, drove a 3,206-lb. 1947 Studebaker in the Class "A" group. Class "A" contestants were authorized under rules of the contest to make major design changes in bodies and engines of stock cars to obtain the extreme fuel economy.

Class "B" entrants, driving stock unstripped family cars were allowed only minor adjustments in timing, carburetion, cooling, etc. In that group, Julian Ryan, driving a 3,392-lb. Chevrolet, also marked up a new record of 81.9 miles per gallon. All 31 entrants in the contest used commercial grade Shell "Activated" premium gasoline. Weight of cars, actual distance traveled, and other factors were weighed in determining winners in each class. Most drivers covered "theoretical" distances ranging between 50 and 100 miles in the contest.

The principal factors increasing mileage are tire inflation, lubrication, and driving technique. This year's winner carried 110 psi. in his tires to reduce road friction. Moving parts in all cars were highly polished and lubricated, and motors tuned with great precision. Engines are run hot to improve their efficiency. Manifolds and radiators are insulated and fan belts disconnected.

The technique of driving the 14-mile hilly course was a major function of the economy obtained. Through constant practice before the contest on June 25, drivers determined exactly where they would accelerate, coast, and turn ignition off and on. The small town of Roxana was included in the circuit and all traffic regulations were observed. Average speed during the contest was about 15 miles per hour.

For obvious reasons, the mileage records obtained in the contest cannot be approached in average driving, the company explains, but the event does emphasize the fact that good maintenance, proper lubrication, and moderate driving speeds will materially increase mileage economy.

Louisiana Group to Study, Redraft Conservation Law

A specially appointed legislative committee which will study and redraft the present conservation law with regard to oil in Louisiana, met in Lafayette last week to discuss problems of mutual interest to land and royalty owners and producers.

Among matters being studied by the committee, which is composed of eight members of the house and senate, is failure of many operators to provide the land and royalty owners with complete and appropriate information relative to the derivation of payments to which they are entitled. Other matters which will be considered by the committee during its meetings include: whether or not the present basis for fixing the allowables within a pool are the most scientific and engineeringly sound procedures available; possibly closer and improved relations between landowner interests and producers; simplification of bookkeeping with regard to royalty payments; and economic advantages of unitization.

Michigan Crude Prices Are Adjusted by Pure Oil Co.

Pure Oil Co. last week announced adjustments in its posted price of Michigan crudes, averaging 11 cents per barrel lower. The new posted price became effective July 1.

Adjustment of price has been made to reflect changes in the relative values of crude produced in the various fields, and Pure is thus the most recent purchaser to adjust crude prices in the state, where downward revisions were initiated as much as 6 weeks previously.

Offshore Areas Opened

The California Department of Natural Resources has opened for seismic exploration for a period of 90 days beginning July 1 three offshore areas near the city of Santa Barbara and the islands of Santa Barbara, San Clemente, and San Nicholas. These areas will not be opened to exploration again until 1952.

International

WORLD-WIDE OIL DEVELOPMENTS

New Consulting Firm Becoming Active in Latin American Work

SEVERAL projects in the petroleum field have been undertaken by International Industrial Consultants, S.A., new technical and service company with headquarters in Caracas.

The organization expects to present to the Dominican Republic early in July its proposal to construct a refinery in that country. International Industrial Consultants holds a refinery concession in the republic which provides for exoneration of crude import duties.

A 25,000-bbl. daily plant was mentioned in the announcement about the project in May. International Industrial Consultants is now studying the possibilities in the export market and is considering several sources of crude oil.

The company also has under way a geological study of the oil possibilities of Cuba on behalf of another group. The survey may be broadened later.

International Industrial Consultants was organized early this year. Robert T. Brinsmade, Caracas attorney and vice president, said its purpose was to initiate, arrange capital, and provide service for industrial projects of all types with particular emphasis on oil. The use of national capital is encouraged.

Other officers are George H. Speirs, president and former president of Seismograph Service Corp. of Delaware; Tom Manhart, former executive vice president of Seismograph Service Corp., treasurer; and Clark Millison, consulting geologist, vice president. Principal associates are Raymond Duboc and Nebita Harwick, president and vice president, respectively, of Columbus Export Corp., New York; and Akbar Brinsmade, former process engineer with M. W. Kellogg Co. Besides Caracas, offices are at 62 William Street in New York and in the McBirney Building in Tulsa.

Officers of International Industrial Consultants are interested in the two newly organized Venezuelan companies, though there is no corporate connection. These companies are Cia. Venezolana de Refinacion de Petroleos, S.A., and Cia. Promotora Nacional de Industrias, S.A.

The first company, of which Harwick is president, is now discussing with the Venezuelan Government the possibility of obtaining royalty crude for a new refinery of perhaps 25,000-bbl. daily capacity. Puerto la Cruz has been mentioned as the most likely site.

The second company was formed in view of a possible change in Venezuelan petroleum policy and the granting of new concessions. Cia. Promotora's operating company, Cia. Nacional de Petroleo, S.A., is now in the progress of being organized.

Refinery at Cardon May Reach 90,000-Bbl. Rate

SHELL OIL CO. OF VENEZUELA, LTD., expects a daily charge of about 90,000 bbl. at its new Punta Cardon refinery in Venezuela when all units are working at capacity.

The refinery recently went into initial operation with the distillation unit on stream and other process facilities in an advanced stage of completion. The Shell organization first started work on the site on Paraguana Peninsula in March 1945 and a complete industrial community has since been built. Nearby is the 60,000-bbl. Creole Petroleum Corp. refinery now under construction.

Shell is planning to erect additional units for the manufacture of lubricating oils and aviation fuel at Punta Cardon. According to a Shell company publication, the following units will be in operation when the refinery is fully functioning: Crude Distilling Plant 1—doctor treating plant; High Vacuum Plant 1—acid treating plant; Thermal Cracking Plants 1 and 2—phosphate treating plant; Redistilling Plant 1—cracked and reformed tops treater; Reforming Plant 1—regenerator plant for spent caustic; Polymerization Plant 1—Ethyl blending plant; Cracked Products Separation Plant 1.

With the refinery running at capacity, annual production will be approximately as follows:

	Bbl.
High-octane gasoline and aviation fuel	343,950
Normal gasoline	2,855,660
Kerosine	478,040
Diesel fuel oil	1,358,640
Lubricating oils of various types, including the highest grades	673,030
Fuel oils (various grades)	40,900,570

It was pointed out that the new Shell refinery will use as fuel annually 1,276,870 bbl. of asphalt and gas to the equivalent of 352,240 bbl. Ultimate plans call for laying a gas pipe line from oil fields in the Lake Maracaibo area. This will release for commercial use the large quantity of asphalt now taken for fuel.

The initial completion of the Shell refinery was commemorated last month when several hundred Venezuelan visitors were flown to the area. Recognition was given to C. F. Louwerse, who has directed the entire project. The visitors included high Venezuelan Government officials as well as others representing industry and commerce.

Drilling to Start Soon In Kuwait Neutral Zone

Test drilling will start this fall in the Kuwait-Saudi Arabia Neutral Zone under a cooperative program just announced by Ralph K. Davies, president of American Independent Oil Co., and J. Paul Getty, president of Pacific Western Oil Corp.

Each company has a concession on an undivided half interest in the zone. The agreement calls for American Independent to complete the exploratory work already started and to drill a sufficient number of wells to test the properties. A converted LST is being fitted out in Orange, Tex., with drilling equipment and living quarters for the crews. The zone covers 2,000 sq. miles and adjoins the large Burghan field in Kuwait proper.

Phillips Completes Second B-1 Field Well, Rated at 1,400 Bbl.

International

PHILLIPS OIL CO. has completed its second well in its newly discovered B-1 field in eastern Venezuela, while in the western part of the country, several companies are drilling ahead in wildcats seeking the deep Cretaceous pay.

Phillips B-2 well, an outpost 440 m. southwest of B-1, was completed as a dual-zone producer with an initial production rated at 1,400 bbl. daily. B-3 and B-4 are drilling at 8,600 ft. and 6,900 ft. respectively.

The Phillips field discovery was announced by the company last January. The B-1 discovery found four successive productive zones with a total net thickness of 165 ft. On a recent gage, the well was reported to have flowed at the rate of 1,800 bbl. daily of 34.9 -gravity oil. The company is now working out marketing arrangements for the oil.

The field is near Roble field. To the northeast of the B-1 discovery, Phillips Santa 1, 8 miles southwest of Roble, is reported drilling below 10,900 ft.

Other Developments Reported

Other operations of interest in eastern Venezuela include Shell's deep test 36 miles southwest of Barcelona. This well, VM-1, was at last report testing at 13,100 ft.

The Cretaceous wildcats hold principal interest in western Venezuela. Creole Petroleum Corp.'s LL 637 in Lake Maracaibo west of Bachaquera field is at 12,763 ft. and preparing to test. The well found the top of the Cretaceous at 12,400 ft.

The Cretaceous limestone producers in western Venezuela are regarded as the most prolific wells in the Western Hemisphere since the heydey of Mexico's Golden Lane. Shell's P-68 in La Paz, second Cretaceous producer in the field, recently went to gas and is to be deepened to another fractured zone. This well has produced some 20,000,000 bbl. since the limestone pay was discovered in 1944.

Venezuelan Atlantic Refining Co. is testing at 5,257 ft. in its No. 5 well in the old Amana field. This is presumably a Cretaceous test since the formation rises to the northwest. Mene Grande Oil Co. Moga 2 well on the west side of Mara field was suspended at 9,462 ft. with no porosity reported. Mogu 2 on the west side of the field is testing at 9,833 ft.

Other western Venezuela wildcats include Shell's ZC-1, 20 miles southeast of Maracaibo, drilling at 12,111 ft.; CT-1, 30 miles south-southwest of Maracaibo City, drilling at 13,451 ft.; DMC-1, 3½ miles east of Mara, drilling at 6,500 ft.; Creole's Santa Cruz, 12 miles northwest of Maracaibo, coring in the limestone at 12,406 ft.; and Creole's Alturitas, southwest of Lake Maracaibo, drilling at 9,723 ft.

Creole's production and drilling reports for April and May show that this company, the major Venezuelan operator, had an average of 24.5 and 24.0 rigs running respectively in the 2 months. This compares to 32 rigs operated the latter part of 1948. The company's operated production during May was back up to 581,983 bbl. daily and in more recent weeks has been averaging above 600,000 bbl. daily.

In May, Creole completed four exploration wells. Two were dry, one in the Cumarebo district at 4,273 ft. and one in the Dabajuro district at 3,734 ft. One in the B.C.F. area was an oil producer, good for 744 bbl. daily on initial production with total depth of 6,400 ft. The fourth was a gas well with a production of 246,000 cu. ft. daily and a depth of 5,261 ft.

In April, the company completed two exploration wells, one in B.C.F., dry at 10,723 ft., and one oil well in Mulata at 5,503 ft.

Creole's May operated daily average production of 581,983 bbl. compares to 498,873 bbl. in April, 475,919 bbl. in March, and 535,643 bbl. in February. Production in 1948 averaged about 635,000 bbl. daily and was cut back sharply early this year because of the weak heavy fuel oil market.

In May runs at the Caripito refinery were only 24,407 bbl. daily against 45,168 bbl. daily in April and 55,426 bbl. daily in March. Runs at La Salina in May were 8,198 bbl. daily, approximately the same as previous months.

German Firm Changes Name

The German affiliate of Standard Oil Co. (N.J.), Deutsch Amerihanische Petroleum Gesellschaft, A.G., (German American Petroleum Co.) is planning to change its name in the near future to Esso Standard (Deutschland) A.G., according to reports from Hamburg.

CENTER OF ITALIAN INTEREST

This is the flow of oil from the Cortemaggiore well in Italy's Po Valley which caused Azienda Generale Italiana Petroli to say would "radically transform" the Italian economy. Last week, however, the Italian Government issued a statement tempering AGIP's enthusiasm by pointing out that the most optimistic estimate of the new field's capacity is production of 20,000 bbl. per day after several years of development

Higher Crude Imports, Greater Reliance On Middle East Mark British Trend

by Dahl M. Duff

International

DATA on imports of petroleum into the United Kingdom bear out the trend toward an increasing percentage of crude oil, greater dependence upon the Middle East, and use of the United States as a supplier of specialty products.

Crude oil constituted about 25 per cent of total petroleum imports, which averaged about 365,000 bbl. daily, into the United Kingdom last year. This compares with 17.8 per cent in 1947, 14.2 per cent in 1946, and 17.7 in 1938. Imports the first 3 months of this year were at a rate of 405,000 bbl. daily with crude constituting about 27 per cent of the total.

The volume of crude oil moving into the United Kingdom is due to rise much more spectacularly over the next few years. The major expansion taking place in the British refining industry is only now beginning to go into the production stage.

Four projects on which work has been commenced are expected to raise total capacity in the United Kingdom by some 280,000 bbl. daily. These are Anglo-Iranian Oil Co., Ltd., at Llandarcy (National Oil Refineries, Ltd.) and at Grangemouth (Scottish Oils, Ltd.), Standard Oil Co. (N. J.) at Fawley (Anglo-American Oil Co., Ltd.) and Shell Refining & Marketing Co., Ltd., at Stanlow and Shellhaven.

Crude-oil imports into the United Kingdom last year averaged about 92,000 bbl. daily, and current refining capacity is estimated at slightly more than 100,000 bbl. daily. The refinery projects are to be completed at varying times over the next 3 or 4 years, and the entire program looks to a total capacity of some 20,000,000 tons (about 400,000 bbl. daily) by 1953.

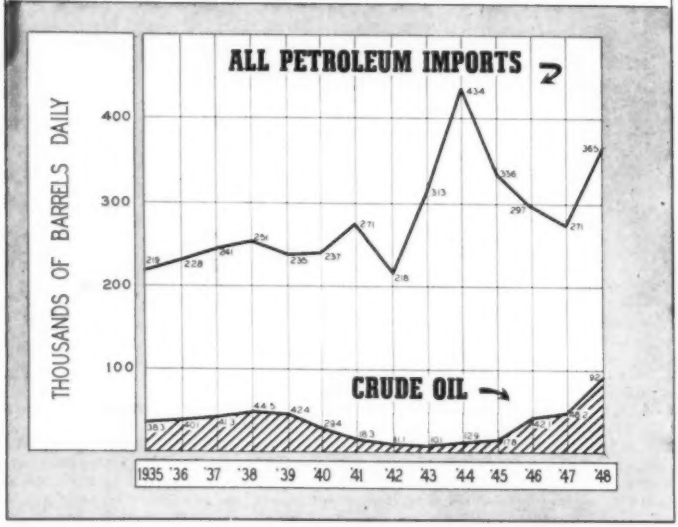
The effect of this greatly increased processing capacity will be a rising percentage of crude oil to total petroleum imports. In the 1952-53 fiscal year, it is estimated crude will comprise more than two-thirds of the United Kingdom petroleum imports.

In that year, according to the interim report of the Organization for European Economic Cooperation, the United Kingdom will use 18,078,000 tons of crude with total imports of 27,785,000 tons (about 550,000 bbl. daily). Virtually all the crude will be imported, since indigenous production amounts to a relatively minor 900 bbl. daily.

The United Kingdom is the largest petroleum-consuming country in Europe. Though the 1930's oil imports showed a slowly upward trend, reaching a total of about 251,000 bbl. daily in 1938. During the war the normal pattern of supply was completely disrupted. Imports rose to approximately 434,000 bbl. daily in 1944 with the United States supplying most of this.

The Netherlands West Indies has traditionally been the major source for refined products to the United Kingdom except during the war period. Imports from the N.W.I. comprised about 33 per cent of total United Kingdom petroleum receipts in 1938 and nearly 40 per cent in 1949. The N.W.I. includes the Aruba and Curacao refining centers. Vene-

UNITED KINGDOM PETROLEUM IMPORTS



UNITED KINGDOM PETROLEUM IMPORTS
(Figures in barrels daily, average)

Country—	1948	1938
Crude Oil		
N.W.I.*	21,700	12,600
Iran	19,300	4,200
Saudi Arabia	13,800	
Bahrein Kuwait	12,300	
Iraq	11,300	11,100
Venezuela	4,500	10,900
Peru	3,100	1,700
United States	1,300	1,200
Other	4,400	2,800
Total	91,700	44,500
Motor Fuel		
N.W.I.*	39,400	46,100
United States	22,200	24,600
Iran	16,700	24,600
B.W.I.†	7,000	7,100
Bahrein Kuwait	1,600	
Venezuela	1,300	
Palestine	1,000	
Soviet Union	700	3,700
Romania		3,700
Other	3,200	4,200
Total	93,100	114,000
Lubricating Oil		
United States	6,200	6,700
N.W.I.*	600	
Soviet Union		1,000
Germany		300
Mexico		300
Other		200
Total	6,800	8,500
Diesel and Fuel Oil		
N.W.I.*	56,300	19,700
Iran	33,200	12,600
B.W.I.†	5,500	9,300
United States	900	4,900
Venezuela	700	
Mexico		2,800
Other	4,900	4,500
Total	101,500	53,800

*Netherlands West Indies—Aruba and Curacao. †British West Indies—Trinidad.

zuelan crude is used in the refineries and also transshipped.

Although the percentage of imports from the N.W.I. last year was up compared to 1938, the proportion from the Western Hemisphere as a whole dropped. The percentage supplied from the Western Hemisphere was 58.4 last year against 64.3 per cent in 1938. This was due principally to decreased imports from the United States, which amounted to 11.8 per cent last year against 18 per cent in 1938, and from the British West Indies (Trinidad).

The drop in Western Hemisphere supply was taken up by oil from the Middle East, principally Iran, with 24 per cent of total imports last year moving from Iran compared to less than 20 per cent in 1938. Saudi Arabia, Kuwait, and Bahrein also are now meeting part of the import requirements of the United Kingdom. These imports from the Middle East also have replaced the oil which the United Kingdom received in the prewar period from Romania and Russia. In 1938, Romania and Russia furnished 3.4 and 2.4 per cent respectively of total imports.

Movements to Increase

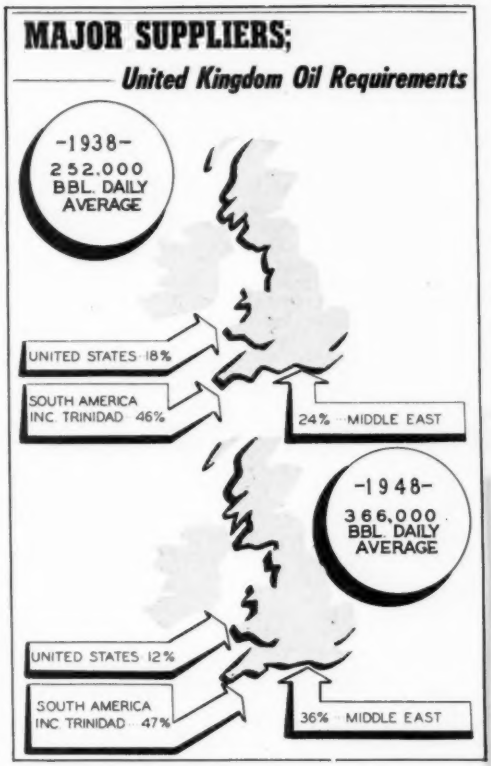
The movement of Middle East oil into the United Kingdom is slated to become much more pronounced over the next few years. The country will draw largely on this source for crude to feed its vastly expanded refining industry. The Economic Cooperation Administration plan contemplates that the Middle East will supply 82 per cent of total European requirements by 1951.

Behind the current British refinery building program and the shift in petroleum supply, both as to type and source, are the needs of the country's economic-recovery program. Petroleum represents a major dollar drain which is to be sharply reduced by domestic refining of Middle East oil, much of it sterling-area production. In addition the United Kingdom hopes for exportable products. The 1952-53 plans calls for a production of 23,989,000 tons of products, imports of 9,707,000 tons of products, and a consumption of 23,989,000 tons (about 480,000 bbl. daily).

The U.K. section of the interim O.E.E.C. report said: "The United Kingdom has a special interest in the expansion of oil supplies. In spite of the fact that the output of the British oil companies is much greater than consumption in the United Kingdom, particularly at the very restricted level which it has imposed upon itself, the oil industry makes at present the largest single claim for dollar expenditure.

"The British-controlled oil companies are engaged in a highly complex foreign trade. Their activities involve large dollar expenditure both for operating expenses and the purchase of equipment. In addition, large quantities of oil are still having to be purchased by British companies from United States companies to meet their market requirements in nondollar areas. . . . To deal with this situation, oil production and refining capacity by British companies are being expanded both to reduce the need to purchase oil from the dollar sources and to enable more oil to be sold to dollar purchasers."

The dollar shortage in Britain as well as petroleum shortage conditions in the United States early in 1948 were responsible for the drop in the share of the United Kingdom market supplied from the United States. All indications are that the United States will not regain its position, even though it now has surplus production.



While the United States supplied only 11.8 per cent of the United Kingdom import total last year, by value these products made up nearly 17 per cent. This shows that the United States is furnishing more of the higher-value specialty products. Last year, the United States supplied about 91 per cent of the total United Kingdom imports of lubricating oil. This is expected to continue, although probably in not as great a volume due to lube plant construction in Britain and elsewhere in the sterling area.

The postwar pattern of individual product imports into the United Kingdom shows a particularly heavy gain in receipts of diesel and fuel oil. Imports of these products have nearly doubled from 1938 to 1948. The increase is duel to greater industrial consumption and wider use of diesel equipment.

Despite the production of coal in the United Kingdom, the British find it profitable to import oil fuel and export coal. Major source for the imported fuel and diesel oil is the Netherlands West Indies.

Motor fuel continues to be rationed in the United Kingdom, and 1948 imports of this product are lower by about 18 per cent than in 1938. The standard ration for gasoline in Britain is 90 miles a month. If this and other restrictions were relaxed, consumption—and imports — presumably would move sharply up, although there are some who feel there would be no immediate spectacular gain. Much heavy transport equipment in the United Kingdom uses diesel oil in a product called D.E.R.V. (Diesel Engine Road Vehicle). Lubricating-oil imports in the United Kingdom also are slightly under the 1938 total, and this apparently in part reflects the lower gasoline consumption.

Imports of kerosine are much greater than prewar, averaging about 31,900 bbl. daily last year against 16,200 bbl. daily in 1938. An even greater rise is shown in gas oil, among the uses for which is enrichment of manufactured gas. Imports of this product have increased from about 12,400 bbl. daily in 1938 to 37,400 bbl. daily in 1948.

The data, including that in the accompanying illustrations, are based on information in the British Government's Trade and Navigation Accounts appearing in the Petroleum Times.

Imports into the United Kingdom are a close reflection of consumption, although more exact figures on usage would depend on stock changes, reexports, and indigenous production. Last year's reexports of imported petroleum were about 3,200 bbl. daily, less than 1 per cent of the total.

Argentine-British Trade Pact Imposes Problems on Refiners

International

THE Argentine-British trade agreement is raising serious problems for the future operations of some of the privately owned refineries in Argentina.

The agreement provides that the British will meet virtually all Argentina's petroleum import requirements. Britain furnishes oil and other products for the sterling which Argentina obtains from the sale of meat and other raw materials.

Some of the Argentine refineries do not have equipment to process the sour crudes which may be made available to them as a result of the trade agreement. Reports are that a large part of the oil which Britain will make available will come from sterling sources in the Middle East.

Argentina's total refinery capacity is placed at 131,300 bbl. daily, and additional plants are under construction by Yacimientos Petroliferos Fiscales, the government oil agency. Of the existing capacity, Y.P.F. has about 72,000 bbl. daily.

The other refineries include Cia. Nativa de Petroleos (Standard Oil Co. [N. J.]), about 22,000 bbl. daily at Campagna; Diadema Argentina (Royal Dutch-Shell), 17,000 bbl. daily at Buenos Aires; and Ultramar, S. A.-P.A. (Socony-Vacuum Oil Co., Inc., and The Texas Co.), about 5,000 bbl. daily at Avellaneda. The Jersey company also has three smaller plants in Argentina in addition to Campagna.

Scur Crude Unsuitable

The Campagna refinery reportedly has been using some Iranian crude. The Ultramar plant's equipment is said to be unsuitable to charge sour crude. The same condition is true to some extent at some of the other smaller plants.

With dollar crude excluded in favor of sterling supplies, the agreement will have the effect of making the American refineries dependent on crude imports provided in the exchange. Socony-Vacuum and Texaco, Jersey, and Shell market in the country, the latter two taking slightly more than 21 per cent each and Y.P.F., an estimated 45 per cent.

Whether world-wide sterling oil production at present is sufficient to take care of the commitments under the agreement also has been questioned. If not, a possibility is that the British would buy dollar-produced oil for sale to Argentina for sterling under the trade agreement.

The British oil interests in Argentina are not anxious to see the American companies eliminated. Private operations in the country have long been faced with the steady expansion of Y.P.F. A dispatch from Buenos Aires last week said that the American-owned refineries in the country would process British petroleum which would prevent them from closing.

Last year Argentina under the Andes agreement imported 4,731,387 tons of petroleum and products (about 95,000 bbl. daily). This included 2,616,387 tons fuel oil; 1,741,657 tons crude; and 217,000 tons of motor fuel. Argentina's crude production is about 67,000 bbl. daily of which an estimated 45,000 bbl. daily is by Y.P.F. In the negotiations for the trade agreement, the British offerred 4,500,000 tons a year, including 1,800,000 tons of crude, 2,500,000 tons of fuel oil, and 200,000 tons of other products. The Argentines sought somewhat greater quantities, including 2,000,000 tons of crude, and 2,700,000 tons of fuel oil.

U. S. May Demand Ending of Argentine Treaty if Trade Conditions Improve

WASHINGTON.—State Department officials indicated last week that they would keep tabs on the new British - Argentine trade agreement and press for its abrogation at any time the major reasons for its negotiation—the two countries' shortage of dollars and gold—are overcome.

Under that agreement, the British Government will buy very large quantities of meat products from Argentina, and British-controlled companies will offer "substantial quantities" of petroleum and products and stated minimum quantities of other commodities to be bought and sold through the customary channels, provided buyers and sellers reach agreements on terms.

The agreement was strongly protested by the department on the ground it was a discriminatory arrangement contrary to the concepts of our reciprocal - trade - agreement policy and the charter of the International Trade Organization, but without success.

While, once the agreement was signed, the department accepted it as a fact, officials refused to say they were satisfied with it although they expressed "gratification" that it had been made more flexible than originally proposed.

It was explained that the arrangement was an effort on the part of the two countries to expand their trade with each other without risking further loss of dollars and gold, and will permit transactions to be settled in sterling. The department recognized the necessities of the situation, but urged that the arrangements should be sufficiently flexible so that they would not continue beyond the period in which they were made necessary by the dollar shortage, and pointed out that a provision has been incorporated providing for the right of either party to terminate the agreement at the end of any year.

The department pointed out also that no firm contracts for the purchase of any commodity except meat are provided for, and the purchase by Argentina of British oil "will depend upon the future decisions of British or Argentine buyers or sellers."

It was also noted that the arrangement provides that the sale of all products except meat depends upon negotiations between buyers and sellers, and neither the United Kingdom nor Argentina is obliged to purchase goods from the other at prices in excess of those available in other markets.

The agreement also reaffirms the United Kingdom's basic objective of returning to convertibility and multilateralism and disavows any intention to discriminate against the trade of third countries, and on the basis of these provisions, the department said, "the United States proposes to discuss periodically with the United Kingdom the nature of actual operations under the agreement, having in mind the ultimate objectives of both governments."

State Oil Monopoly in Paraguay Is Dissolved

Paraguay has revoked a state monopoly over the distribution of petroleum products and returned the business to private enterprise.

Legislation was recently approved withdrawing the monopoly given in August 1947 to the state agency, Administracione de Empresas Fiscales. The two private oil importing companies, West India Oil Co. and Shell Mex Argentina, Ltd., are expected to increase their storage facilities.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Pointing Up Point Four

WASHINGTON.—Congress is not expected to enact legislation this session to launch President Truman's "Point Four" program to encourage private investment and otherwise aid in the industrial development of backward areas, but a number of federal agencies are preparing to work out plans to get the program going with such assistance as Congress may be willing to give when a definite blueprint is laid before it.

Secretary of Commerce Charles Sawyer has been given the job of developing the expansion of American industrial activities abroad, and after Congress goes home he will appoint an advisory committee consisting of the heads of a number of the most important companies in a group of industries which might be interested.

While it is recognized that the oil industry itself is alert to any chance of expanding its foreign operations, the name of the president of one of the major companies already has been jotted down for membership on the committee, with the idea that his broad knowledge of international affairs will be helpful.

A great deal of valuable information on the needs of foreign areas, possibilities of production, markets, and similar factors has been compiled since the end of the war by the Office of International Trade. The most encouraging areas are seen as Latin America and parts of the Far East, later possibly Africa.

Commerce officials will work with industries to develop projects for foreign operations, with the State Department handling the negotiation of the actual agreements with foreign governments for the entry of American capital, dealing with such subjects against expropriation, restrictive laws, etc., and providing for convertibility of profits and other factors which go to make the "climate" in which the companies will operate.

Truman's Tariff Troubles

OVERLOOKED in the more important developments in Congress, the Reciprocal Trade Act expired June 30 without any legislation to continue the administration's tariff-trading program.

In itself, lapse of the law meant little since the reciprocal trade agreements previously negotiated continue in effect and negotiation in Europe of a new multination pact under the International Trade Organization charter will go on although, of course, no new agreements can be consummated until Congress revives the law.

The House passed a bill extending the act some time ago but the measure has not yet been brought up in the Senate where, as so definitely demonstrated by the vote not to make good President Truman's promise that the Taft-Hartley Act would be repealed, administration leaders are becoming convinced that instead of leading the procession they have been relegated to a place back of the calliope.

So far as the reciprocal trade measure is concerned it is beginning to look as though the Republicans might shape that legislation in a way not happily anticipated by the administration. At the moment, there appears to be little chance of adoption of Senator Thomas' proposal to establish quotas for oil imports, but there is a good chance that a peril-point provision may be written in which would prohibit the President from reducing import rates below a figure which the Tariff Commission might find would threaten injury to domestic producers.

Republicans back of this plan are confident they can secure Senate acceptance. They are sure, too, that once the Senate wrote in a peril-point provision it would sit tight, and if the House refused to go along would simply let the situation lie where it fell. And that is the nightmare of the boys in the State Department who fear that if the act is not revived this session and the country finds itself in the midst of a recession next year the Reciprocal Trade Act will be a dead duck.

Off Again, On Again

THE Public Roads Administration, once a bureau in the Department of Agriculture and more recently a part of the Federal Works Agency, bounced again last week and came to rest as a bureau in a new General Services Administration created by Congress to bring together the so-called housekeeping services of the Government.

Also transferred to the new GSA was the Bureau of Federal Supply, long an important arm of the Treasury Department, which is supposed to do all of the purchasing for the Government not conducted through the military services.

The reorganization was prompted by the Hoover investigation of the federal set-up, but the Hoover commission did not recommend that Public Roads be considered a housekeeping activity. Instead, it recommended that the PRA be transferred to the Commerce Department and last month President Truman sent seven reorganization plans to Congress, one of which did move PRA to Commerce.

The General Services Administration was purely a congressional idea, but the President signed the bill, at the time mentioning that he had sent the Public Roads transfer to Congress, but without saying whether he would recall it.

Accordingly, as the situation stands now PRA has moved to GSA but if Congress stays in session long enough for the President's reorganization plans to become effective (they do so automatically after 60 days if neither House exercises a veto) PRA employes may find themselves in Commerce unless House or Senate takes pity on them and says let them stay put.

It's all very confusing—like so much else that happens in Washington.

Sour on Severance

THE National Planning Association's recent recommendation to the President's Council of Economic Advisers that the southern states impose severance taxes on oil and natural gas which would bring their cost to a par with other fuels has met with a very sour reaction from the oil industry.

The N.P.A. held that unless Texas and Oklahoma took action of this nature to make their reserves last longer they might find themselves a "blighted area" when their oil and gas are exhausted. But members of the oil industry read further that if the states didn't adopt severance taxes voluntarily, the federal Government should levy them and use them for the economic development of the producing states; and immediately yelled "state socialism."

Russell B. Brown, general counsel of the Independent Petroleum Association of America, is one of those objecting to the report. He dug into his voluminous files last week and fished out another report of the National Planning Association, issued in 1944, which recommended that imports of oil should be steadily built up so that by 1950 they would total 1,000,000,000 bbl. a year. A little investigation, Brown said, disclosed that the 1944 board of trustees and N.P.A. committees included "certain war-agency officials" who might be considered to be supporting the fancy then current in some administration

circles that we should keep our oil in the ground lest we become a have-not nation ahead of the rest of the world.

Brown pointed out that some of the men in the N.P.A. were with the National Resources Committee which later became the National Resources Planning Board and was legislated out of existence by Congress when it began to blueprint a planned economy which the congressmen couldn't take.

A number of NRPB experts are scattered around Washington today, leading Brown to suggest that "there is something to be said for segregated districts."

Unification Note

GREAT strides toward unification of the armed forces are being made under the dynamic leadership of Secretary of Defense Louis Johnson.

Hereafter, it has been announced, a uniform pass will be used by all military personnel in the 39 buildings in Washington occupied by the National Military Establishment instead of the separate passes heretofore used by the three miliary departments.

Executives will be issued passes with a gold border; others will have passes with the same background colors but a green border, according to a 400-word explanatory statement of the Office of Public Information.

The Trust Buster

ATTY. GEN. TOM C. CLARK commemorated his fourth year in office as attorney general June 30, and marked the event by publishing a 39-page report on the accomplishments of the Department of Justice during that period.

The department's batting average before the Supreme Court has improved under Clark's coaching—during the past four terms the Government has won an average of 76 per cent of its cases in that tribunal as compared to an average of 75 per cent won during the preceding seven terms.

There have been 21 attorneys general since passage of the Sherman Act in 1890 and the average number of cases filed by each has been 42; since Clark took office 160 cases have been instituted. The total number of cases filed in the past 58 years is 986, and Clark expects to touch the 1,000 mark before he leaves the department.

Among the important land cases handled under Clark's direction was that involving the California tidelands, which he personally argued before the Supreme Court March 13, 1947, and the similar cases filed last December against Texas and Louisiana. The big tax cases included that involving some $4,000,000 in income taxes of the Universal Oil Products Co. for the years 1944 and 1945, now pending on appeal. These cases, Clark said, are of tremendous importance to the Treasury since the point at issue is whether the taxpayer is exempt from income tax as an eleemosynary trust.

All in all, it's been a busy 4 years.

Gulf Asks Commission for Discovery Well Allowable

A discovery allowable and new pool designation for production from its 4-D "HH" Texas Consolidated Lease well in Crane County, Texas, is being sought from the Texas Railroad Commission by Gulf Oil Corp. Engineer J. R. Crump has asked that production be designated as the University Waddell (Devonian) field.

He said the well produces from the Devonian through open hole from 9,040 ft. On potential it made 520 bbl. of 39.9°-gravity oil and 18 bbl. of water daily through ½-in. choke. Gas-oil ratio is 1,321-1.

Suit Asks Du Pont Drop Antidetonant Business

WASHINGTON.—The Department of Justice has filed an antitrust suit in federal court in Chicago against E. I. du Pont de Nemours & Co. to require it to divest itself of stock in General Motors Corp., United States Rubber Co., and other companies.

The department asked that Du Pont be required to sell its business of making tetraethyl lead, ethyl fluid, and ethyl chloride, and that General Motors be ordered to sell its 50 per cent stock interest in Ethyl Corp., manufacturer of antiknock fluid for blending with gasoline.

The department asked also that Du Pont be required to dispose of all its stock in General Motors, and that members of the Du Pont family sell all of their stock in United States Rubber Co.

The complaint charges that each of the three companies—Du Pont, General Motors, and U. S. Rubber—are required to purchase from the others substantially all requirements of products which they produce, thus depriving outside suppliers of an opportunity to compete for such business.

It also charged that Du Pont has expanded its production facilities, through acquisitions of competing concerns and enlargement of its existing plant facilities, so as to be able to produce the types, kinds, and quantities of products in the chemical and related fields needed by General Motors and U. S. Rubber.

Permian Basin Corrosion Tour to Be Held Sept. 27

The annual Permian Basin corrosion tour sponsored by West Texas chapter, National Association of Corrosion Engineers, will be held September 27-30 in Midland, Tex. Due to a larger anticipated attendance, field tours have been broken into smaller groups to enable the covering of every corrosive area in the Permian Basin.

Jersey Seeks Capital

Standard Oil Co. (N. J.) filed last week with the Securities and Exchange Commission a registration statement covering $150,000,000 in 25-year, 2¾ per cent debentures which the company plans to sell publicly through a group of underwriters. Proceeds of the issue will be used by the Jersey company to replenish working capital and expand domestic and foreign operations.

Next Week

Continuous contact coking.—Flow arrangement, data, and discussion of new process developed for conversion of heavy residuum oils into coke and valuable light-hydrocarbon products. By engineers with Lummus Co. and Gulf Research & Development Co.

Take photos down well bores?—The Journal's California district editor presents discussion and picture sequences for new camera that photographs casings in wells.

Drilling and completing Utah's deepest producer.—J. W. Gibson, with The California Co., Denver, describes operational data for this 8,857-ft. TD producer which, via submergible electric centrifugal pump, has averaged 500 bbl. of oil per day.

Worland (Wyo.) field development.—Neil Williams, Journal associate editor, discusses petroleum engineering problems in this operation which produces from the Embar lime at 10,000-10,200 ft. One interesting item is that the flow up the tubing tends to freeze, so hot oil is circulated through separate lines down the annulus of each well to raise the temperature.

Maintenance program.—J. A. Oslin, with Magnolia Petroleum Co., Beaumont, discusses cost control, engineering functions, equipment, materials, and other phases in this major program at Magnolia's 150,000-bbl.-per-day refinery at Beaumont.

PERSONALS

Baker Is a Veteran of Texas Co. Operations

R. F. BAKER, The Texas Co.'s new vice president in charge of domestic producing operations, is a veteran in the production field, having begun his career with the company as a geologist in the Tulsa offices in 1916.

He served as geologist for the firm in Houston after World War I, and in 1920 he was named chief geologist of the company. He was transferred to the New York offices in 1929, continuing as chief geologist, and 4 years later was named assistant to the vice president. On April 1, 1947, he became general manager of the producing department.

His election as vice president in charge of domestic producing operations was announced last week, and he succeeds R. Ogarrio, who was made chairman of an executive producing committee.

A native of New Haven, Conn., Baker received a Ph.B. degree in 1912 from Sheffield Scientific School at Yale University. He served for a time as geologic aide for the U. S. Geological Survey prior to seeing service during 1918 in the U. S. Army.

E. G. Dobson, who has been senior petroleum engineer for Texas Petroleum Co. in Colombia, has been made chief engineer for Texas Petroleum's Venezuelan organization, at Caracas. Other recent changes in Texas Petroleum Co. include: **Leslie Manning,** transferred to new duties as geologist with Colombian Petroleum Co. on the Barco concession; **D. D. McGirk,** geologist in Colombia, transferred to the Mercedes operation in Venezuela; **Hans Tanner,** formerly in Colombia, new duties as geologist in Venezuela with headquarters in Caracas; and **H. C. Goheen,** formerly in Colombia, new assignment as geologist for Antilles Petroleum Co., Ltd., in Trinidad.

E. V. Watts has been appointed production superintendent of the southern division, General Petroleum Corp. He has been with the company since 1936.

W. P. Wilson, geologist for Sinclair Oil & Gas Co., has arrived in Calgary, Alta., Canada, where he will be engaged in geologic work for the company in its Canadian program.

Roy E. Darke, for the past 30 years a geologist for Standard Oil Co. of California, has retired from the company, and is now a consultant on production of subsurface water in the San Joaquin Valley of California.

Barney G. Harbison, chief engineer for Plomo Co., has joined Process Engineers, Inc., Dallas, as erection foreman in charge of relocating gasoline plants.

C. A. Miller, assistant division superintendent in the Rocky Mountain area for Kerr-McGee Oil Industries, Inc., has been named division superintendent for the area.

C. J. Allen, Sinclair Refining Co., has been elected a vice president of the firm, and **I. J. Bergholt** has been named assistant treasurer.

James L. Cartisser, kilnman at the Bayonne, N. J., refinery of Tide Water Associated Oil Co., recently received $1,500 as first prize in the company's suggestion plan for the best idea submitted during 1948. His winning suggestion was a method for reducing loss of catalyst beads from catalytic cracking units.

Roland V. Rodman, president of Anderson-Prichard Oil Corp., Oklahoma City, has been elected president of Col-Tex Refining Co., subsidiary, succeeding the late L. H. Prichard.

F. A. Heitmeyer has been named northern district drilling superintendent for Standard Oil Co. of California, succeeding **Charles L. Brewster,** who has retired after 40 years' service. Heitmeyer, whose headquarters will be at Taft, Calif., joined the company 25 years ago, and served on several foreign assignments, including exploratory work in Colombia and in Alaska.

N. B. Larsh, formerly district geologist in the Midland, Tex., office for Sinclair Oil & Gas Co., has resigned after 22 years' service with the company, and has joined Danciger Oil & Refining Co. as district geologist in Midland.

H. M. Fritts, newly named manager of exploration for the Midland, Tex., area for Shell Oil Co., Inc., has arrived in Midland from Houston where he will take over duties formerly handled by **Gordon H. White.** White resigned recently to join Nile Oil Co. in Dallas as president.

Elmer C. Simpson has been named deputy supervisor of District 7-C, Texas Railroad Commission's Oil and Gas Division, succeeding the late Edward Bierschwale. Simpson joined the commission last December after retiring from Magnolia Petroleum Co.

George W. Evans has been appointed coordinator of pipe lines and manager of purchasing for Continental Oil Co., Ponca City, which is a newly created position. He will be succeeded as general purchasing agent by **S. V. McCollum,** who formerly was assistant. In his new position Evans, in addition to having executive direction over purchasing, will coordinate activities of Continental Pipe Line Co., and activities of subsidiary companies.

G. W. EVANS

E. R. Rice, independent oil operator, has moved to Midland, Tex., from Los Angeles, and will devote his time to work in the Permian basin area.

Max K. Watson, with Canadian River Gas Co. for 20 years, has resigned from the company and has opened consulting offices in Amarillo, Tex., specializing in gas valuations, regulations, and proration.

Homer N. Lewis, superintendent of the Illinois basin at Bridgeport, Ill., for Ohio Oil Co., has been transferred to Cement, Okla., as superintendent of the Carter Knox and Cement pools.

Lot Bowen, Western Gulf Oil Co., has been elected chairman of the Conservation Committee of California Oil Producers. Other officers include: **T. W. Bell,** The Texas Co., and **Ross McCollum,** National Oil Co., vice

chairmen; and **Henry F. Power,** General Petroleum Corp., secretary.

C. M. Hinton has been named manager of production and drilling for American Republics Corp., with headquarters in Houston. He formerly was with The Texas Co. for 11 years in its operating department, and served as production foreman, general foreman, and assistant petroleum engineer. He also served 1 year as assistant manager of Texaco Exploration Co., in charge of drilling and production at Calgary, Alta., Canada.

E. B. Palmer has been appointed to the new position of assistant manager at Union Oil Co. of California's Los Angeles refinery, and **H. C. Meiners** has been elevated to the same position at the firm's Oleum, Calif., refinery. The company reported that **M. S. Thompson** has been promoted to superintendent of cracking and **Frank Van Acker** has been named assistant superintendent of cracking at the Los Angeles plant.

E. T. Monsour, consulting geologist, Jackson, Miss., has been elected president of the Mississippi Geological Society. Other officers elected include: **E. C. Black,** Skelly Oil Co., vice president; **W. H. Knight,** Union Producing Co., treasurer; and **F. T. Holden,** Carter Oil Co., secretary.

Herman T. Ashmore, geologist at Tyler, Tex., for Amerada Petroleum Corp., has been transferred to Midland, Tex., in the same capacity.

John F. Conley, superintendent of the Kansas division, Magnolia Petroleum Co., has assumed duties as general superintendent of part-interest operations with headquarters in Dallas. Other promotions reported by the company's production department include: **W. B. Powers,** assistant superintendent, Gulf Coast division, promoted to superintendent of the Kansas division replacing Conley at Wichita; **J. J. Bresenham, Jr.,** assistant district superintendent at Kermit, Tex., transperred to Pampa, Tex., as district petroleum engineer; and **E. G. Blundell,** petroleum foreman at Kermit, assuming duties of assistant district superintendent in the Kermit producing district.

Clark Barrett of Sabine River Works of E. I. du Pont de Nemours & Co. at Orange, Tex., was elected chairman of the newly organized Sabine Area Chemical Engineers Club. Other officers include: **Carroll O. Buttrill,** chairman elect; **Hal A. Lund,** secretary-treasurer; and **G. Emery Springer,** executive-committee member. All are employes at Magnolia Petroleum Co.'s Beaumont, Tex., refinery.

Matthew E. Miller, gangpusher in the Healdton, Okla., district for Magnolia Petroleum Co., has been promoted to production foreman of that district. The company also announced that **Halbert M. McClain** has resigned from the petroleum-engineering department, and will become an independent engineering consultant in Dallas.

Ralph K. Paine has been appointed manager of the pipe-line department, Standard Oil Co. of California, succeeding **Clyde A. Swigart** who has been elected a vice president of Trans-Arabian Pipe Line Co. Paine has been general superintendent of the southern California district of the pipeline department since 1946. **L. E. Joses** will succeed Paine as southern district general superintendent, and **E. B. Saunders** will serve as superintendent. **E. J. Hyde** has been named superintendent of operations control for the department, with headquarters in San Francisco.

C. A. SWIGART

R. K. PAINE

Marshall Smith has been promoted to drilling superintendent of Hoover Drilling Co., Inc., and **E. J. Hoover** and **Price Duffield** have been promoted to tool pushers. The company is presently engaged in drilling operations in the Cuyama Valley area of California.

Directors and officers of Oklahoma Natural Gas Co. are shown before their departure by bus recently for a general inspection tour of the company's properties. Left to right: D. W. Reeves, general sales manager; L. C. Ritts, director; P. K. Sticelber, vice president, land and geological department; J. A. LaFortune and John Mitchell, directors; Paul R. Taylor, Stone & Webster Service Corp., New York City; H. H. Ross, vice president in charge of operations; Gen. W. S. Key, Oklahoma City, and C. H. Pape, directors; Joseph Bowes, president; A. E. Bradshaw, chairman of the board, and F. W. Peters, secretary-treasurer. Directors not present were J. F. Darby, R. C. Allen, George Frederickson, and W. G. Skelly

ELEVEN MONTHS ON LINE WITH Nalco

Unretouched refinery photo of high-transfer heat exchanger, taken immediately after opening following eleven months on line.

...and clean as the day it started!

This heat exchanger was labeled the most troublesome unit in the refinery from a standpoint of scaling and corrosion before the Nalco No. 33 Method of recirculating cooling water treatment was put in operation. Now, routine inspections show tubes that are always so clean that no cleaning or tube replacements due to water side scaling or corrosion have been necessary during three years of Nalco System use!

Check the features of the Nalco No. 33 Method at right and translate its advantages into time, materials and equipment savings for your own cooling water recirculating system. Full details on request.

NATIONAL ALUMINATE CORPORATION
6242 West 66th Place **Chicago 38, Illinois**

Canadian inquiries should be addressed to Alchem, Limited, Burlington, Ontario

Nalco

LOW pH METHOD OF RECIRCULATING COOLING WATER TREATMENT

- Provides *complete* recirculating system protection from scaling and corrosion.
- Maintenance of pH between 6.0 and 6.5 prevents scaling, stops delignification of cooling tower lumber, and cuts chemical requirements for slime and algae control as much as 50%.
- Use of Nalco No. 33 builds microscopic, impervious protective film on pipelines and equipment to positively prevent corrosion.
- Non-toxic Nalco No. 33 makes use safe; eliminates contamination problems.
- Silica concentrations in recirculating water may be allowed to run much higher without danger of SiO_2 depositions.

THE Nalco SYSTEM • Serving the Petroleum Industry through Practical Applied Science

WHEN IS MUD NOT MUD?

Oil drillers know the answer—when it's a drilling mud, a combination of chemicals.

Ever since drilling muds went chemical, DIAMOND ALKALI has been involved. DIAMOND produces a number of the basic chemicals now used to control the properties of drilling fluids: DIAMOND Sodium Bichromate and Chromate to check corrosion of drill pipe and other equipment; DIAMOND Caustic Soda, Soda Ash and Silicate for controlling viscosity, gel strength and pH value of drilling fluids. Without their help, much of today's deep drilling could not be performed.

In chemicals for both oil refining and oil production, DIAMOND stands for top service, convenience and dependability. DIAMOND Chemicals for drilling mud are furnished "at the well" by leading mud service companies and their dealers in all important producing areas.

DIAMOND SALES OFFICES: Boston, New York, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Chicago, St. Louis, Memphis, Wichita, Oklahoma City and Houston. Also representatives in other principal cities.

DIAMOND CHEMICALS FOR THE OIL INDUSTRY

DIAMOND ALKALI COMPANY...CLEVELAND 14, OHIO

DIAMOND ALKALI CHEMICALS

George Clark Gester, consulting geologist for Standard Oil Co. of California, and widely known as an authority on world and domestic reserves, has retired from the company after 32 years' service. Gester began his career as an assistant instructor in geology at the University of California in 1908. He served as geologist for Southern Pacific Co., helping to organize that firm's petroleum division, and as chief development geologist for Kern Trading & Oil Co. In 1917 he went to work in Standard's geology department, and later was named chief development geologist.

Lewis D. Hedrick has been named division superintendent of Oklahoma and Texas for National Cooperative Refinery Association, with headquarters in Houston. He was formerly assistant production superintendent for Bay Petroleum Corp. at Denver.

Roy T. Durst, production superintendent, Rowan Drilling Co., in the Houston office, has moved to the home office in Fort Worth.

C. R. Neal, geologist for Cities Service Oil Co. at Great Bend, Kans., for the past 2 years, has joined J. M. Huber Corp., as geologist at the company's Wichita office.

Ralph I. Ellsworth, engineering instructor at the University of Texas, has joined American Republics Corp. at Houston as junior petroleum engineer.

L. P. Foote, plant superintendent for Ohio Oil Co. in California, has been transferred to Houston in the same capacity.

Robert E. Caraway, petroleum engineer, North Texas district, Standard Oil Co. of Texas, has been moved to Midland, Tex., where he will assist the manager of all company nonoperated joint ventures.

SHIFTS—

George H. Fentress, engineer, Phillips Petroleum Co., Golden, Colo., to Bartlesville, Okla.; **R. G. Juhre,** engineer, Mohawk Petroleum Corp., Bakersfield, Calif., to Hoquiam, Wash.; **Peter H. Gardett,** engineer, General Petroleum Corp., San Gabriel to Laguna Beach, Calif.; **James S. Hopkins,** foreman, Amerada Petroleum Corp., Santa Ana to Oxnard, Calif.; **J. R. Ramirez,** engineer, Standard Oil Co. (Ind.), Santa Ana, Calif., to Hammond, Ind.; **Weldon C. Julander,** geologist, Stanolind Oil & Gas Co., Farmington, N. M., to Emporia, Kans.; **F. S. Nesmith, Jr.,** engineer, Stanolind Oil & Gas Co., Beaumont, Tex., to Tulsa; **Edward W. Porter,** engineer, Phillips Petroleum Co., Borger, Tex., to Hurrah, Okla.; **Dan F. Kralis, Jr.,** geologist, Eastland, Tex., to Fresno, Calif.; **O. I. Jantz,** foreman, Amerada Petroleum Corp., El Campo to Three Rivers, Tex.

Luther P. Turner, foreman, Humble Oil & Refining Co., Freer to Charlotte, Tex.; **Lawrence A. Kuebler,** geologist, The Texas Co., Houston to Corpus Christi; **D. W. Rogers,** superintendent, Delta Drilling Co., Mexia to Tyler, Tex.; **Robert H. Parks,** engineer, Sunray Oil Corp., Nordheim to San Antonio, Tex.; **Charles R. Mooney,** superintendent, Humble Oil & Refining Co., Pasadena to Lolita, Tex.; **John V. Bossi,** engineer, Phillips Petroleum Co., Phillips to Dumas, Tex.; **Z. D. Bonner,** engineer, Gulf Oil Corp., Port Arthur, Tex., to Washington, D. C.; **J. F. Binkley,** engineer, Barnsdall Oil Co., Victoria to Snyder, Tex.

A. L. Hall, engineer, Reno Oil Co., Wichita Falls, Tex., to Tulsa; **H. P. Shackelford,** Tide Water Associated Oil Co., foreman, Winnsboro to Scroggins, Tex.; **W. C. Best,** engineer, Delhi to Shreveport, La.; **L. C. Becker,** superintendent, Shell Oil Co., Inc., Iowa to Lake Charles, La.; **O. C. Day,** superintendent, Interstate Oil Pipe Line Co., Vivian to Ida, La.; **Richard L. Fedell,** engineer, Phillips Petroleum Co., Smackover, Ark., to Rangely, Colo.; **William R. Waggoner,** superintendent, Pure Oil Co., Chicago to Worland, Wyo.; **W. E. Randall,** superintendent, Art G. McGee Co., Robinson, Ill., to Rotterdam, Holland.

J. S. Leonard, superintendent, Ohio Oil Co., Reed City, Mich., to Freeport, Tex.; **L. S. Murphy,** engineer, Davis Mud Sales, Worland, Wyo., to Midland, Tex.; **H. H. Knapp,** engineer, Phillips Petroleum Co., Tulsa to Eureka, Kans.

Joseph Jackson, superintendent, Imperial Oil, Ltd., Entrance to Wembley, Alta; **B. G. Harbison,** foreman, Plomo Co., Robstown to Alice, Tex.; **Oliver R. Young,** foreman, Pure Oil Co., Sulphur Springs, Tex., to Jal, N. M.

DEATHS

Herbert S. Austin, 65, pipe-line consultant on design and construction to Iraq Petroleum Co., Ltd., died near Easton, Pa., July 5. He formerly was pipe-line coordinator for Standard Oil Co. (N. J.) and served as representative in London for Near East Development Co. He retired in 1940.

John William Stafford, 34, accountant in the production department, Pan American Production Co., Houston, died recently.

Dr. Charles August Mann, 63, professor and head of the department of chemical engineering, University of Minnesota, died June 25.

Harold Richard Delaney, 55, partner in the firms of M. J. Delaney Drilling Co., and D.K.M. Oil Production Co., died July 1 in Dallas.

Tom H. Armstrong, 51, employe in the transportation department, Mid-Continent Petroleum Corp., refinery in Tulsa, died June 29.

James C. Kennedy, Bartlesville, Okla., superintendent of the land-lease department, Cities Service Oil Co., died July 2.

John Allen Richards, 50, Port Arthur, Tex., veteran employe at The Texas Co. refinery at Port Arthur, died June 29.

Thomas E. Mobley, 70, former director in charge of production, Standard-Vacuum Oil Co., before retirement in 1942, died July 2 in Parkersburg, W. Va.

H. G. Farrell, 38, operator of Farrell Rig Co., Shawnee, Okla., was drowned June 26 in Lake Lawtonka, Oklahoma.

A. M. Foute, 62, secretary of Mission Manufacturing Co., died in Houston June 29.

Lessie Johnson, 62, chief clerk in the engineering department, The Texas Co., died June 19 in Port Arthur, Tex.

Earl W. McFall, 53, vice president of Creslen Oil Co., Dallas, was killed by lightning in San Antonio, June 25.

Clifford R. Ramage, 65, vice president and director of Diamond Chain Co., died June 22 in Chicago.

Henry P. Coolidge, 54, Sunburst, Mont., independent oil operator, died June 26.

Frank H. Brock, 69, Los Angeles independent oil operator, died in Brownwood, Tex., July 1.

William T. Frey, 27, auditor for Deep Rock Oil Corp., Tulsa, died in Muskogee, Okla., June 27.

Scurry County, West Texas

LIMESTONE-REEF DEVELOPMENT

Constitutes most important oil discovery in area in recent years . . much drilling in prospect as operators prepare to prove extent of area

by D. H. Stormont
District Editor

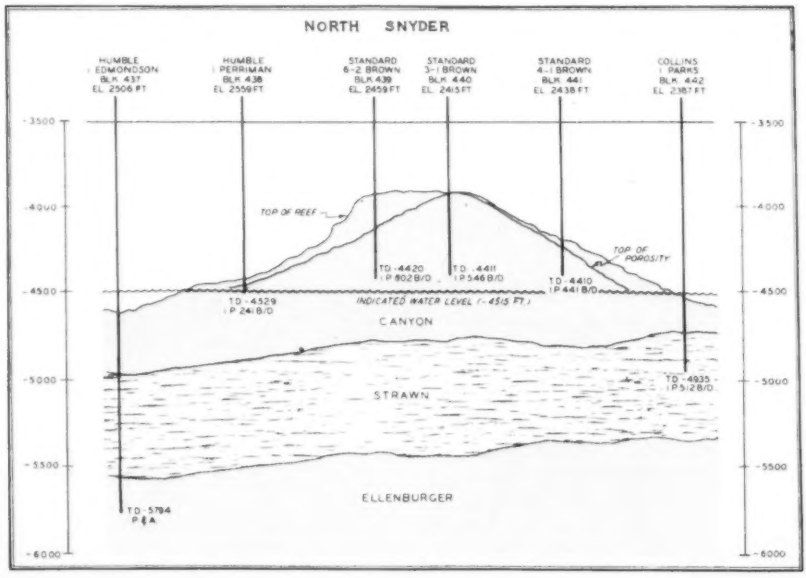
MIDLAND.—In West Texas today the most discussed topic among the oil fraternity is Scurry County's rapidly expanding limestone reef development. That the trend of Pennsylvanian reef fields constitutes a major oil discovery, probably even the most important in West Texas in recent years, is generally conceded by geologists and engineers familiar with the area. All that remains in their opinion, is for the drill to prove the areal extent of these new fields and to give a more accurate estimate of the oil reserve contained therein.

Briefly described, the situation is this. A northeast-southwest trend of Pennsylvanian reef production, some 18 miles in length, has been established in the western part of Scurry County. At the northern end is the 17-well North Snyder area. Some 7 miles south lies the 3-well Kelly area, 2 miles west of this production is the 1-well Schattel field, and 4 miles farther west is the 10-well Diamond-M field. At the southwestern end, 2 miles south of the latter pool, is North Sharon Ridge (Canyon) field. All produce from reef pays, generally placed as Canyon, topped between 3,800 and about 4,435 ft. subsea.

Discovery and development of these fields have taken place since July a year ago. Activity was comparatively slow in getting under way, but in recent months drilling has steadily increased until some 35 rigs now are in operation.

Just how important the discoveries really are remains to be determined by actual drilling. Only little coring has been done to date and drilling is insufficient to give a good subsurface picture. Likewise it is not known for sure whether the reservoirs will be of solution-gas drive or whether they will be water driven. It is expected the latter will prove to be the case. Finally, geologists are quick to point out that the tricky nature of reef fields precludes any accurate estimate of their ultimate areal extent—that they can play out most unexpectedly because of their slopes and irregular nature. Nothing, they feel, should be taken too much for granted until proven by the drill.

Should a strong water drive develop, as the optimists believe will be the case, they feel the North Snyder area alone will approach Yates in oil recoveries. They do not hesitate to say yields will reach 400 bbl. per acre-foot of net pay, or that reserve



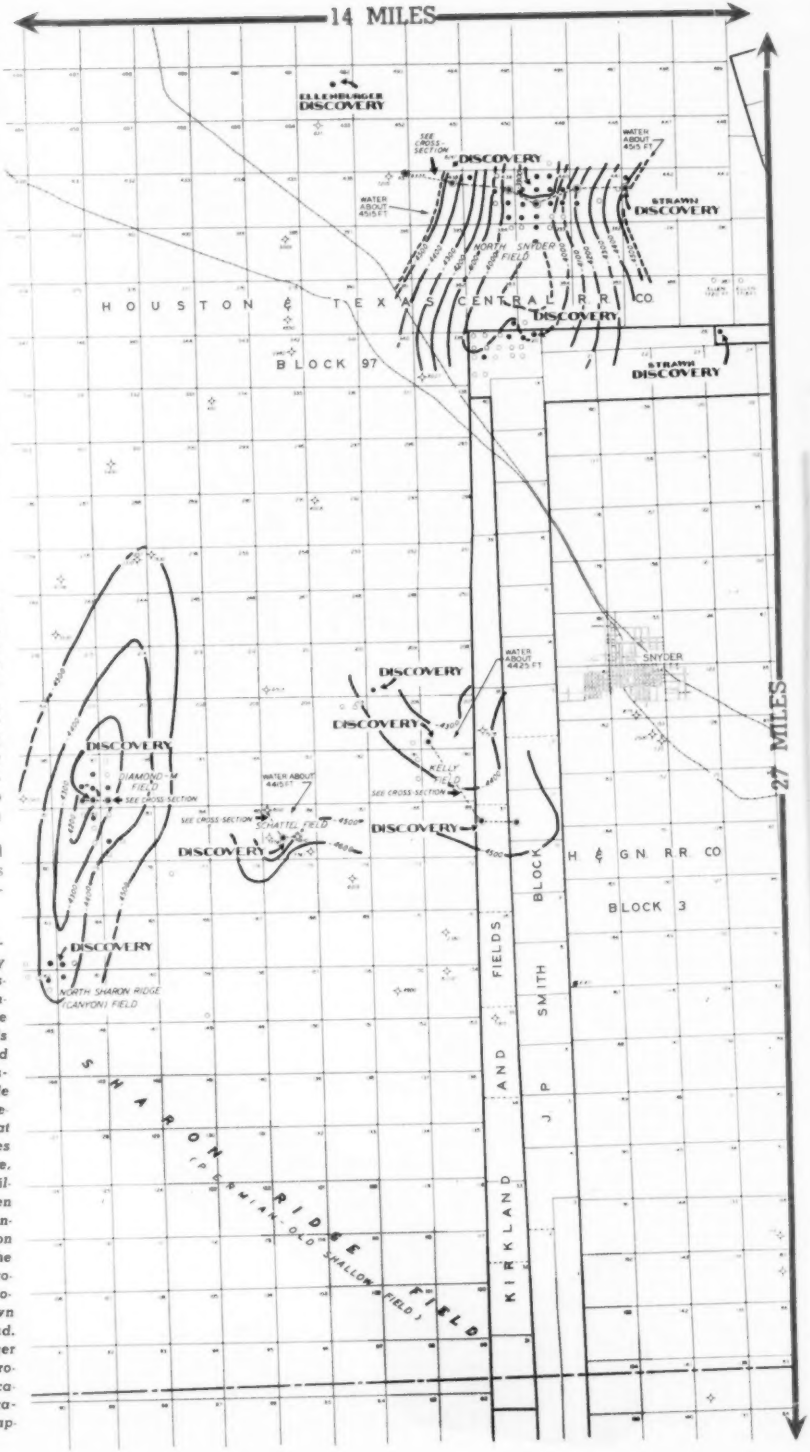
East-West cross-section through North Snyder field. Thickness of productive section (porosity between 15-20 per cent, about 75 per cent of thickness oil saturated) of this towering subsurface limestone reef reaches a maximum of approximately 600 ft.

of around 100,000 bbl. per acre should be given the North Snyder area. And, based on existing knowledge, there is at least some basis for their high estimate.

Despite this limited knowledge some of the more optimistic oil people familiar with the area, all having experience with reef pays, feel the new discoveries have added approximately 1,000,000,000 bbl. to Scurry County reserves. They point out the almost 700-ft. oil-producing section which is found in some North Snyder producers, and compare it with the thinner section in Yates and the average 65-ft. of pay in the Big Lake Ellenburger. Here yields of about 16,000 bbl. and over 20,000 bbl. per acre, respectively, have been obtained to date.

At the time of this writing no core-analysis data were available on North Snyder field. Analyses run on several cores taken from a well in Diamond-M field, however, are reported to have shown a recoverable oil content of 225 bbl. per acre-foot. The cores analyzed were believed to be from pay having a below-average porosity.

In North Snyder field effective porosity is thought to be better de-


14 MILES
27 MILES
ELLENBURGER DISCOVERY
DISCOVERY
STRAWN DISCOVERY
NORTH SNYDER FIELD
H O U S T O N & T E X A S C E N T R A L R R CO
BLOCK 97
SNYDER
DISCOVERY
DIAMOND-M FIELD
SCHATTEL FIELD
KELLY FIELD
H & G N R R CO
BLOCK 3
NORTH SHARON RIDGE (CANYON) FIELD
S H A R O N R I D G E (PERMIAN-OLD SHALLOW FIELD)
KIRKLAND AND FIELDS
BLOCK J P SMITH

In this 14-mile-wide by 27-mile-long area in Scurry County, West Texas, 11 "discovery" wells have been completed in recent months. Some of these discovery wells have more lately been found to represent "segmental discoveries" of larger single pools. Further drilling between fields may show that some of the fields themselves may connect up. At any rate, one group contends over 1 billion barrels of oil are proven by the drilling to date. Contours shown are drawn on the subsurface top of the Canyon reef, principal producing formation and productive for all wells shown unless otherwise designated. The Strawn and Ellenburger also have been found productive at designated locations. (Base and well locations courtesy Southwest Mapping Co., Fort Worth)

veloped than at Diamond-M, averaging somewhere between 15 and 20 per cent, with about 75 per cent of the pay section being oil saturated. Thus if the field should prove to have an average pay thickness of 300 ft., the average net saturation would amount to 225 ft. Applying the 400-bbl. acre-foot factor would give the area a reserve of 90,000 bbl. per acre.

One reason why the optimists feel these high recovery figures will be achieved at North Snyder is their belief the field will have a good water drive. The field is an undersaturated reservoir; gas-oil ratios average 800 to 900 cu. ft. per barrel with a solution ratio of 967 to 1. Therefore, they claim there would have to be a water drive to furnish the "kick" indicated by the pressure-production history of early wells.

Bottom-hole pressure of the discovery well was 3,021 psi. at 6,400 ft., and after producing 23,500 bbl. of oil there was not apparent change in pressure. Furthermore, producing at rates from 100 to 400 bbl. daily, fill up was rapid and the productivity indexes were relatively constant—between 6.0 and 6.7. This, it is believed, indicates a good water drive.

More conservative estimates place the new reserves at around 200,000,000 bbl. Geologists and engineers making these estimates believe that an oil recovery of 100 bbl. per acre-foot will be a good figure in areas having a well-developed pay section. Or, in the North Snyder area where the pay may average 300 ft. over 6,000 acres or more, they agree that a recovery of 22,500 bbl. per acre may be obtained. They want more core data, and proof of the existence of a water drive before raising their reserve estimates.

At earlier stages in the development, some 4 or 5 months ago, there was considerable talk of the possibility of oil production being established along the entire trend. Most of the acreage in the western part of Scurry already was under lease and all remaining was soon acquired. An extensive amount of lease trading also took place as late comers sought to get into the play. Royalty trading was the most active—and high priced—of any West Texas development in recent years. Royalty under tracts several miles from production was, and still is, selling for $250 to $450 per acre. Proven royalties have sold for as high as $2,000 to $2,400 per acre, it is reported.

Now, practically all geologists familiar with the area believe there is scant chance that oil production will be more or less continuous along the entire trend of fields (see map). Instead, they feel the new discoveries mostly will prove to be separate reservoirs.

Additional fields could be discovered along the trend they point out; however, these could be wherever reef buildup is sufficient to place the oil zones above the water level. Or other fields such as the Strawn producer (Collins 1 Parks) east of North Snyder, could be found in lower Pennsylvanian beds.

While geologists are generally in agreement on this possibility, they disagree as to whether there is one large massive reef or a belt of reefs. Many lean toward the theory that oil production is from a belt or chain of reefs, generally paralleling one another with their principal axes in a north-south direction. Others hold to the theory there is only one huge, irregularly shaped reef with its axis lying in a northeast-southwest direction. Geophysical work to date is not believed to have been too successful in clarifying this picture so that only drilling will give the correct solution.

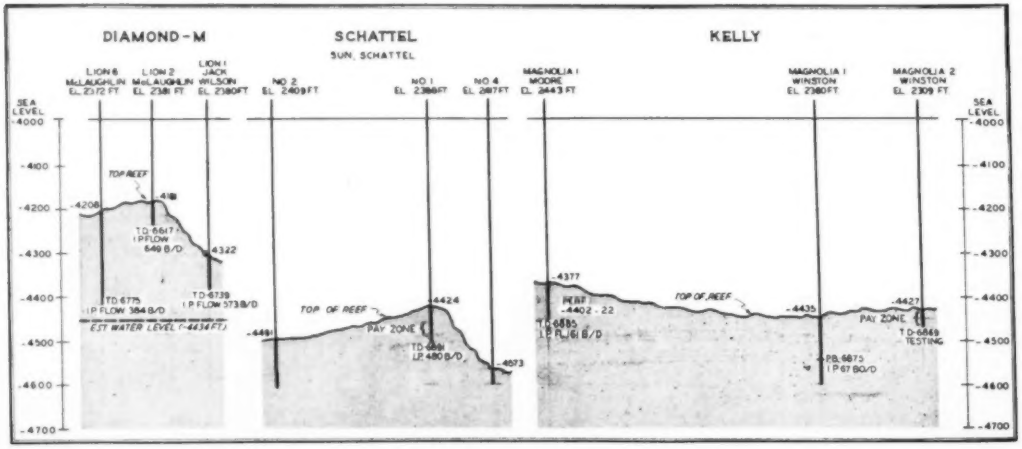
Most geologists believe that all these fields are producing from reefs of Canyon (middle Pennsylvanian) age. Others are not so sure the reefs are of Canyon time, believing that some may have began their growth in Strawn time. To date there has been no evidence found that the reefs continued to grow during Cisco time. It is not regarded as too unlikely, however, that reefs of Cisco or Strawn time will be encountered in the vicinity of the present activity.

Because of the lack of deep drilling in the area only little is known of underlying Mississippian and Ellenburger oil possibilities. Little structure, possibly a slight nosing, is thought to exist in the Ellenburger. Located on the eastern platform of the Midland basin, regional dip is to the west.

As has been previously indicated, the North Snyder area is by far the most promising discovery to date. As shown by the accompanying map, drilling on the Standard Oil Co. of Texas block has been largely a conservative stepout development near the highest part of the reef. There it has completed some 14 producers to date, all for initial potentials of about 500 bbl. daily flowing through small chokes.

Structurally highest well completed in this area to date is Standard's 1-2 Brown in Section 440. This producer, the discovery well, topped the reef at —3,831 ft., or about 610 ft. higher than the well completed lowest on the North Snyder reef. The low well, Humble Oil & Refining Co. 1 Perriman in NW Section 438, of 1½ miles west, topped the reef at —4,440 ft. and encountered porosity at —4,490 ft. After drilling some 24 ft. of porous pay it encountered bottom water. The well then was plugged back and com-

East-West cross-sections through Diamond-M, Schattel, and Kelly fields which are located south and west of the North Snyder area. These cross-sections show the top and upper part of the Canyon Reef formation at these points



pleted in the porous section for a potential of 241 bbl.

The Humble producer drilled into water at 4,514 ft. subsea. The Collins Strawn producer, 1 mile east of present Canyon reef production, also encountered water in the reef pay at about the same level. These are the only two wells carried to water in the North Snyder area. The fact they encountered water at practically the same level indicates the oil-water contact in the reef pay may be at about 4,515 ft. subsea. Assuming this to be the case would give the Standard 1-2 Brown about 675 ft. of oil pay, as is shown in the cross-section.

Assumption that oil saturation may exist almost throughout the 700-ft. section is based largely on drill-stem tests conducted at Standard of Texas 3-1 Brown (south offset to discovery well). Tests were taken at about 50-ft. intervals from the top of the reef at —3,915 ft. to total depth, 6,826 ft. (4,411 ft. subsea), and oil was recovered at all levels.

High Porosity on Reef Top

Where a producer is completed well up on the reef good porosity is encountered immediately upon leaving the overlying black shale. Cavernous porosity has been shown in some cases, as well as a considerable amount of fracturing, while other cores indicate streaks of very low porosity. Drilling rates vary from around 2 minutes per foot in soft, friable sections to as much as 15 minutes per foot. One geologist attributed the harder drilling section to chert fragments. Floroscopic examination of these cuttings, however, he said revealed just as good oil saturation as in the softer sections.

That the oil column may be even thicker was indicated about the middle of June by Standard 5-2 Brown (north offset to the discovery). This well, which will be the first to core the entire reef and be carried to the Ellenburger, topped the reef 26 ft. higher. Thus the indicated maximum pay to date is 701 ft., and the pay section may grow even thicker as development goes northward.

Just how far north the field will extend will have to be proven by drilling. It is thought that because of the steep slope indicated by defining wells on the east and west, this distance will not be too great. However, as was pointed out earlier, almost nothing can be assumed as certain in a reef field.

Standard of Texas has 9 rigs engaged in expanding its production and to the south 2 miles some 13 rigs are at work in what is believed to be an extension area. The first well completed there, Sunray Oil Co. 1 Brown, was about 200 ft. lower structurally than Standard 1-2 Brown. Sunray 3 Brown, an east offset, however, topped the reef 104 ft. higher than 1 Brown and Barnsdall Oil Co. 1 Wren, a west offset, hit the reef 18 ft. higher. Thus the reef in this area may be thicker than first indicated.

Typical jackknife-type rig in the southern extension area of North Snyder field. Of the 20-plus rigs now operating there, only 2 employ standard derricks

Despite an indicated saddle between the two areas they are expected to link together because of the huge production section involved. Should this be the case it is anticipated that the field's proven area will amount to at least 6,000 acres. Some geologists place the field's ultimate area at over 12,000 acres. Because of the number of small leases, and their diversity of ownership, a comparatively rapid development is forecast for this southern portion of North Snyder field.

That production is not limited to the Canyon reef alone is shown by Collins 1 Parks. This test encountered water in the reef, top of which is called at 4,550 ft. subsea, so that it was carried to the Strawn. The Strawn was topped at 7,122 ft. (—4,735 ft.) and hole carried to total depth of 7,322 ft. There it was completed for a flowing potential of 512 bbl. of oil daily.

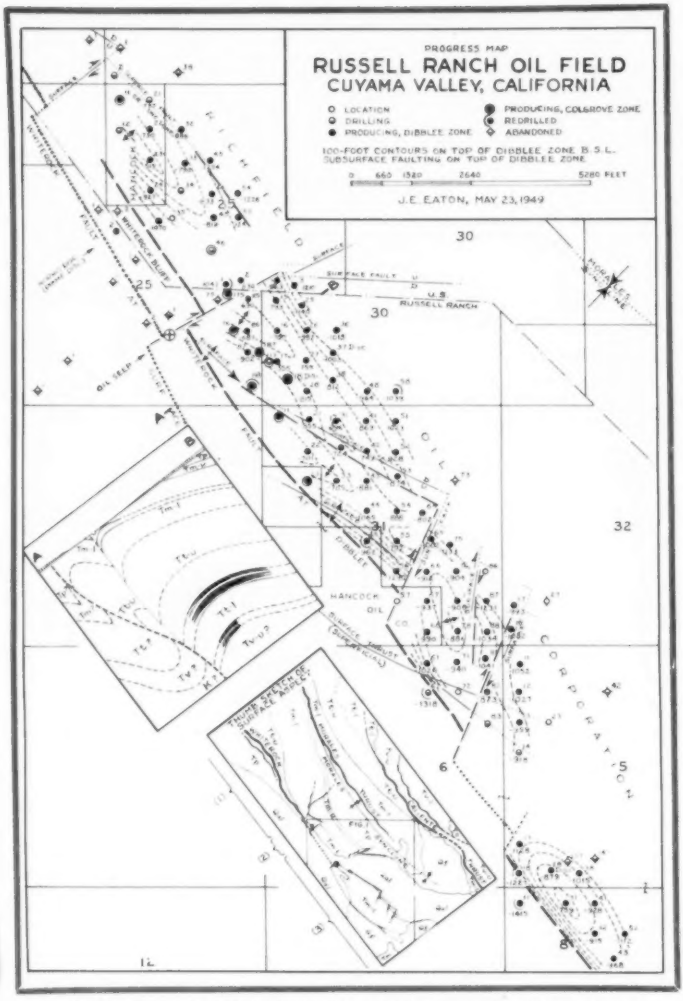
After producing some 5,000 bbl. of oil, however, the producer began to make water. The volume of water increased from day to day until it amounted to 70 per cent of the well's output. Cause for this large water production is thought to be the result of a packer failure. Currently the operator is attempting to correct the water condition.

Existence of the dry hole drilled by Humble in SW SW Section 339, less than 2 miles from oil production in North Snyder field, has failed to curb the optimism of other operators in this area. The entire section has been leased, mostly by Standard of Texas, and drilling is under way just 1.5 miles from the dry hole.

Principal reason why the dry hole, 1 Davis, is being discounted is the belief that some 100 to 150 ft. of reef pay was overlooked. When the well was drilled in 1946, operators were paying only slight attention to Pennsylvanian reefs—if oil production was not found in the Permian, the Ellenburger (or Silurian and Devonian) was the next main objective. In fact most operators preferred to encounter a thin Pennsylvanian section in the hope that such was caused by structure in the Ellenburger. At that time fluoroscopic examination of cuttings was not being too widely applied. The almost complete absence of oil staining in cuttings from these reef pays makes use of fluoroscopes almost an absolute necessity in picking up the oil saturation.

Reexamination of cuttings from 1 Davis has resulted in the top of the reef being called at about —4,312 ft.

(Continued on page 87)



Geologic map of Russell Ranch field. (Preprint, courtesy A.A.P.G. Bulletin)

Cuyama Valley

Now in its second year, this California area is living up to early expectations. Production exceeds 20,000 bbl. daily

by Robert Harwick
District Editor

JUNE 13 marked the first anniversary of the opening of California's Cuyama Valley fields. Broadly speaking the valley has lived up to the early expectations advanced by those familiar with the area. No official figures are available but reports indicate that several hundred million barrels of 32 -gravity oil are recoverable under present production practices. Total production is now in excess of 20,000 bbl. a day from two proven fields, while both development and exploratory work are continuing. Richfield Oil Co. has two seismograph parties in continuous operation in the valley, and two other companies also have crews working the area.

Cuyama Valley is in eastern Santa Barbara and western San Luis Obispo counties, California. It lies west of the San Andreas fault, about midway between the San Joaquin Valley and the coastal region producing areas. The valley is a large sedimentary basin approximately 50 miles long and 15 miles wide. Most of the north central section is part of the Russell Ranch lands.

Prior to the discovery, Cuyama had seen oil activity off and on for a number of years. For the most part opinion in oil circles held the area as unfavorable for production. What drilling had been done gave proof to this opinion. Less than a dozen wells, all by small operators, had been drilled up to the time of drilling the

Russell Ranch area looking toward White Rock

The Cuyama Valley from the air, looking southeast. White Rock is the first hill off the valley floor at lower left center. Russell Ranch area is located in the broad portion of the valley beyond and to the right of White Rock. South Cuyama is 5 miles beyond Russell Ranch, upper center of the picture

discovery well. Most were abandoned before reaching conclusive depths, and none gave indications of commercial production.

In the later part of 1947, following several years of intensive geological work, Richfield commenced leasing operations in Cuyama Valley. In all, the company leased a total of nearly 150,000 acres in the Russell Ranch and South Cuyama areas. Several other companies were also interested and secured land rights, notably Hancock Oil Co. and Southern California Petroleum Corp. in the northern sectors, and Superior Oil Co. in the south. All of these companies now have production in the valley.

First Commercial Production

The first well was put down by Richfield on Russell Ranch land, 28-5 Russell. It reached the top of oil-bearing sand at 2,920 ft. The well bottomed at 3,360 ft., showing more than 400 ft. of productive sand. On June 13, 1948, the well was brought in flowing 500 bbl. a day of 38.3 -gravity oil. This was the first commercial production in the valley and opened the whole region to further testing.

Before the Russell Ranch well was completed, Richfield began a second well, 37-50 Anderson-Colgrove. The drilling site was set 2¼ miles to the northwest of the Russell Ranch well and at the valley edge in what is known as the White Rock area. Five days after the discovery came in, Anderson-Colgrove came in flowing at the rate of 4,000 bbl. per day of 32.8 -gravity oil. Total depth of this well was 3,022 ft.

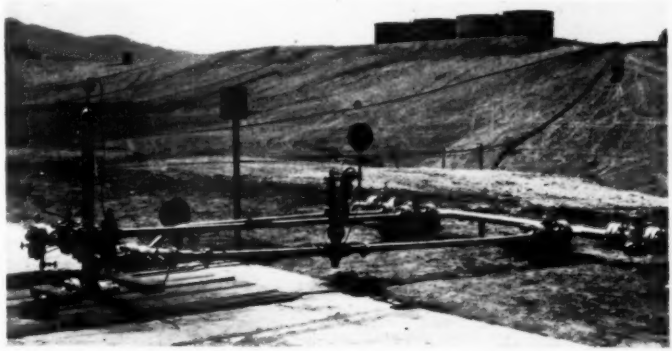
Subsequent drilling indicates that the White Rock area and the Russell Ranch area are joined and form one continuous pool. The two areas together are now known as Russell Ranch field. Drilling to date has carried the proven area of this field over a north-south distance of more than 4 miles.

The producing horizon in this field is equivalent to the Vaqueros formation of lower Miocene age. This is the same as is found in Elwood field, north of Santa Barbara. The Russell Ranch structure is essentially that of an elongated half-dome lying against a normal fault. The producing sand was named by Richfield the Dibblee sand after Thomas W. Dibblee, field geologist of the Richfield company.

In February 1949 a lower producing zone was found in this field, Richfield's 18-30 Anderson was completed at 3,642 ft. in an oil sand lying about 500 ft. below the Dibblee sand.

(Continued on Page 89)

Russell 28-5, discovery well, beaned back and flowing 250 bbl. a day



The Relationship of
Physical Properties and Ultimate Analysis for
Liquid Hydrocarbons

by Henry R. Linden

Introduction

SINCE the carbon-hydrogen ratio has long been recognized as one of the more useful and fundamental criteria for the empirical prediction of many physical and thermochemical properties of liquid hydrocarbons, continuous efforts have been made to obtain this criterion by simpler means than ultimate analysis. The less-involved standard physical tests for petroleum products such as specific gravity, A.S.T.M. distillation, aniline point, and refractive index have been used by a number of investigators for the development of empirical correlations between some function of the physical properties measured by these tests and the hydrogen content or C/H ratio.[1,2,3] Success in correlating physical properties with ultimate analyses at comparable accuracies for petroleum fractions and the pure hydrocarbons constituting these fractions has been limited.

At this stage of development of petroleum technology the concentration of pure hydrocarbons or of classes of hydrocarbons in commercial petroleum products due to refining, treating, and cracking is usually insufficient to require empirical correlations which apply equally well to pure compounds, simple blends, and complex mixtures.

The trend towards petroleum products containing a concentration of a given class of hydrocarbons appears, however, to justify the development of methods for correlation of hydrocarbon properties less sensitive to structural effects. In the work presented here an attempt has been made to reduce some of the effects of structure on existing correlations based on average physical properties of liquid petroleum hydrocarbons by modifying the mathematical form of the previous correlations.

Some of the published work on the interrelationship of the properties of liquid petroleum fractions was reviewed in the light of additional experimental data and coordinated with the revised correlation of physical properties and the C/H ratio.

From the work of Watson, Nelson, and Murphy;[1] Cauley and Delgass;[2,3] Smith and Watson;[4] Linden and Othmer;[5] Watson and Nelson;[6] and Ball[7] it appeared that the C/H ratio of a liquid hydrocarbon may be expressed as a function of aniline point, gravity, and average boiling point and that for mixtures of sufficient complexity to reduce the effects of structure the C/H ratio may be expressed as a function of the gravity and average boiling point alone.

It had also been found that the average boiling point can be expressed as a function of the volumetric average boiling point and the distillation slope obtained from an Engler-type distillation or can be estimated from the kinematic viscosity and gravity. Smith and Watson recommended a mean between the cubic average boiling point and the true molal average boiling point for use with the correlation of hydrogen content[4] of petroleum fractions with the U.O.P. characterization factor[6] (see nomenclature) and the average boiling point. This boiling point is designed as the mean average boiling point (t') and can be expressed as a function of the volumetric average boiling point (t), namely:

$$t' = t - \frac{1{,}470\ S^2}{T} \qquad (1)$$

$$\text{or } T' = T - \frac{1{,}470\ S^2}{T} \qquad (2)$$

where T is the absolute volumetric average boiling point in °R (t + 460), T' the absolute mean average boiling point in °R (t' + 460), and S the 10 to 90 per cent distillation slope. Equations 1 and 2 were derived from the published plots of t — t' vs. S by Smith and Watson.[4]

Inconsistencies in methods for de-

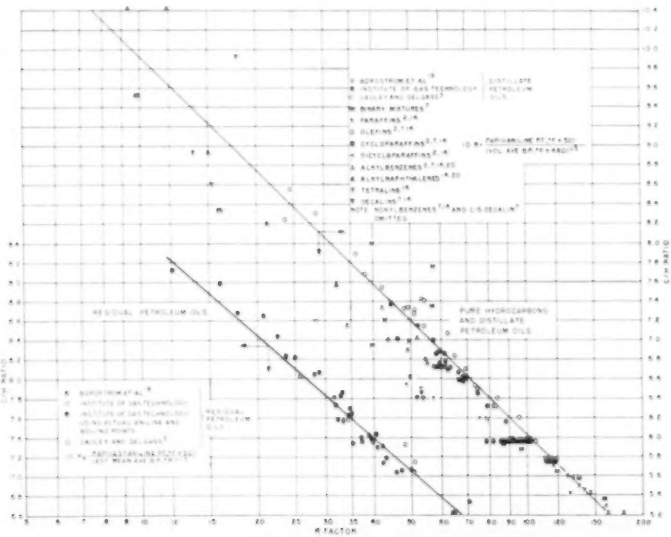


Fig. 1—Carbon-hydrogen ratio versus K factor

*Supervisor, Oil Research Laboratory, Institute of Gas Technology, Chicago.

Note: The relationships presented here were developed as a part of the research on "Enriching Value of Oils for Carburetion" sponsored by the Gas Production Research Committee of the American Gas Association, a part of the PAR plan. The experimental work was conducted in the laboratories of the Institute of Gas Technology at Chicago.

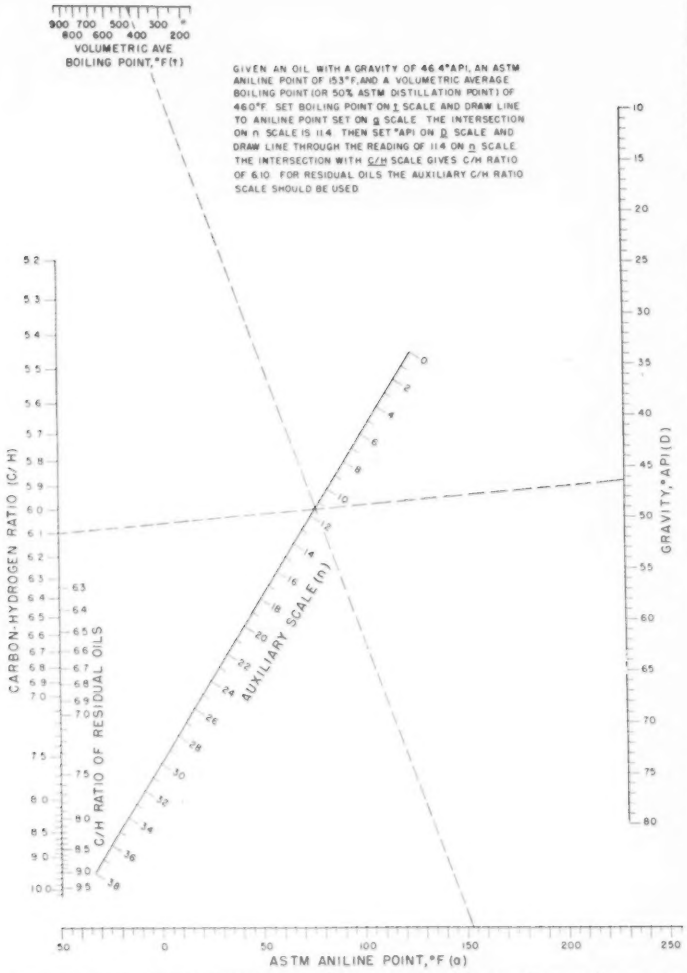

VOLUMETRIC AVE BOILING POINT, °F (t)
GIVEN AN OIL WITH A GRAVITY OF 46.4°API, AN ASTM ANILINE POINT OF 153°F, AND A VOLUMETRIC AVERAGE BOILING POINT (OR 50% ASTM DISTILLATION POINT) OF 460°F. SET BOILING POINT ON t SCALE AND DRAW LINE TO ANILINE POINT SET ON a SCALE. THE INTERSECTION ON n SCALE IS 11.4. THEN SET °API ON D SCALE AND DRAW LINE THROUGH THE READING OF 11.4 ON n SCALE. THE INTERSECTION WITH C/H SCALE GIVES C/H RATIO OF 6.10. FOR RESIDUAL OILS THE AUXILIARY C/H RATIO SCALE SHOULD BE USED.
CARBON-HYDROGEN RATIO (C/H)
C/H RATIO OF RESIDUAL OILS
AUXILIARY SCALE (n)
GRAVITY, °API (D)
ASTM ANILINE POINT, °F (a)

Fig. 2—Nomograph for determination of C/H ratios of liquid hydrocarbons, with correction for residual petroleum fractions

termination of aniline points used by the various investigators may not have a significant effect since the relationship between the critical solution temperature in aniline (the "maximum" aniline point) and the A.S.T.M. aniline point (based on equal volumes of oil and aniline) is one of near identity according to Ball[7] for all but the low-molecular-weight pure hydrocarbons. However, sufficient information on the critical solution temperature is not available for petroleum fractions.

Experimental and Literature Data

Only a limited quantity of new experimental data had to be obtained to supplement the available literature data. Complete analyses of 16 oils including 8 residual oils were obtained. The aniline points of the dark oils were determined with an adaptation of the thin film apparatus of A.S.T.M. method D611-47T.[8] Ultimate analyses were determined on a macro scale by an adaptation of A.S.T.M. method D271-44 according to the Millin technique.[9] The vacuum distillations were performed at 10-mm. Hg pressure following the procedure of the tentative vacuum distillation method developed during 1947 by A.S.T.M., Section A, Subcommittee VIII, Committee D-2.

The literature data reporting densities of pure hydrocarbons at various temperatures were converted to A.P.I. gravities by assuming the density of water at 60° F. = 0.9990 and using standard volume corrections for petroleum oils.[10] Boiling-point data at other than 760-mm. Hg pressure were corrected with vapor-pressure data for paraffin hydrocarbons.[11] The boiling points for hydrocarbons other than paraffins obtained by this method are therefore inaccurate and their use is justified only in functions such as (Absolute B.P., °R.)$^{1/3}$ where the effect of these deviations is minimized. The same holds for the vacuum distillation data for residual oils.

The experimental and literature data are summarized in Fig. 1.

Correlation of Data

Development of the "R" factor.—From the review of the work of Watson, Nelson, and Murphy,[1] Cauley and Delgass[2,3] and Ball[7] it appeared that a function of the gravity, average boiling point, and aniline point would best correlate the carbon-hydrogen ratios of liquid hydrocarbons. The function finally chosen and designated as the R factor correlated best with distillate petroleum fractions and the classes of hydrocarbons most abundant in petroleum oils. Residual petroleum oils deviated in a consistent manner while low-boiling monoalkyl benzenes and saturated and partially saturated polycyclics exhibited more erratic deviations. The R factor is defined in terms of °A.P.I. (D), A.S.T.M. aniline point, °F. (a), and mean average boiling point in F. (t') as follows:

$$R = \frac{D\,(a + 50)}{10\,(t' + 460)^{1/3}} \qquad (3)$$

In Fig. 1 two plots of the actual carbon-hydrogen weight ratios versus the R factor are shown for 76 petroleum fractions, 111 pure hydrocarbons, and 9 binary mixtures. One plot is used for residual oils and the other for the remaining hydrocarbons. The volumetric average boiling point (t) was used instead of the mean average boiling point (t') whenever actual aniline points were obtainable in view of the negligible error caused by this simplification.

For petroleum fractions, t was assumed to be equivalent to the 50 per cent A.S.T.M. or 10 mm. Hg vacuum distillation point while for pure hydrocarbons the atmospheric boiling point was used. The average boiling point of binary mixtures was assumed to be the volumetric average of the two pure components.

Estimating aniline points and mean average boiling points.—Aniline points of samples for which experimental aniline points (a) were not obtainable were calculated from the A.P.I. gravity (D) and the absolute mean average boiling point (T') by the equation:

$$a = 0.400\,D\,(T')^{1.5} + 0.317\,T' - 298 \qquad (4)$$

Equation 4 was derived from the petroleum-fraction data used in Fig. 1 and those by Watson, Nelson, and Murphy.[1] The mean average boiling point is defined by Equations 1 and 2. It should be noted that Equation 4 is applicable only to petroleum frac-

TABLE 1—ESTIMATED ANILINE POINTS FOR CRUDE OILS

Crude sample—	Lit. ref.	Grav., A.P.I (D)	50% dist. pt., °F. (t)	10-90% dist. slope (S)	Mean ave. B.P., °F. (t')	—Aniline pt., °F.— Actual (a)	Estimated (a_e)
Michigan	15	34.8	572	8.31	475	160	134
East Texas	15	38.4	595	9.85	460	172	142
Slaughter	15	31.0	585	10.00	445	143	109
Mirando	15	21.2	620	5.84	573	131	114

tions of nearly constant distillation slope (S). For crude oils, characterized by a high S which increases with increasing distillation temperature, a will be higher than the actual aniline point (a) as shown in Table 1.

There are similar indications that samples which have continuously decreasing distillation slopes give positive deviations; however, such deviations are reduced by using the true volumetric average boiling point (average of 10, 30, 50, 70, and 90 per cent A.S.T.M., Engler or 10-mm. Hg vacuum distillation points). For 37 samples for which the necessary data were available the arithmetic average deviation of the aniline point was 6.6° F.

Substituting Equation 4 in Equation 3, a modified R factor (R_i) is obtained which is suitable only for petroleum fractions:

$$R_i = 0.0400\ D + D\left(\frac{0.0317\ T' - 24.8}{(T')^{1.3}}\right) \quad (5)$$

When the aniline point as well as the mean average boiling point (i.e., the 50 per cent distillation point and the distillation slope) were not obtainable as was the case for most residual oils, the mean average boiling point was estimated from Equation 6 below (t_v'):

$$t_v' = \log v\left(1.60\ D + \frac{790}{1.40 + v^{0.15}}\right) + 350 \quad (6)$$

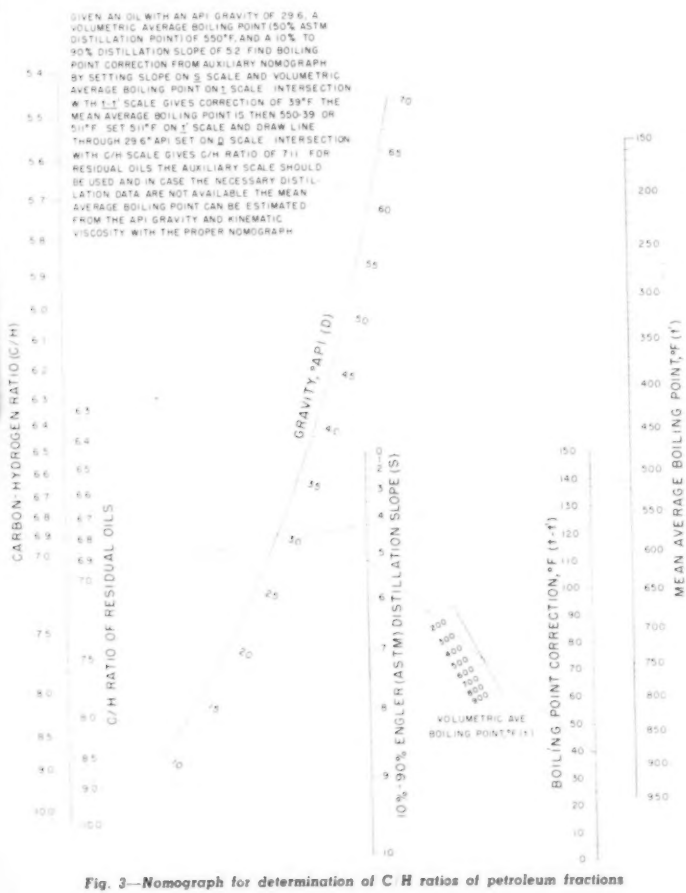

GIVEN AN OIL WITH AN API GRAVITY OF 29.6, A VOLUMETRIC AVERAGE BOILING POINT (50% ASTM DISTILLATION POINT) OF 550°F, AND A 10% TO 90% DISTILLATION SLOPE OF 5.2. FIND BOILING POINT CORRECTION FROM AUXILIARY NOMOGRAPH BY SETTING SLOPE ON S SCALE AND VOLUMETRIC AVERAGE BOILING POINT ON t SCALE. INTERSECTION WITH t-t' SCALE GIVES CORRECTION OF 39°F. THE MEAN AVERAGE BOILING POINT IS THEN 550-39 OR 511°F. SET 511°F. ON t' SCALE AND DRAW LINE THROUGH 29.6° API SET ON D SCALE. INTERSECTION WITH C/H SCALE GIVES C/H RATIO OF 7.11. FOR RESIDUAL OILS THE AUXILIARY SCALE SHOULD BE USED AND IN CASE THE NECESSARY DISTILLATION DATA ARE NOT AVAILABLE, THE MEAN AVERAGE BOILING POINT CAN BE ESTIMATED FROM THE API GRAVITY AND KINEMATIC VISCOSITY WITH THE PROPER NOMOGRAPH
CARBON-HYDROGEN RATIO (C/H)
C/H RATIO OF RESIDUAL OILS
GRAVITY, °API (D)
10%-90% ENGLER (ASTM) DISTILLATION SLOPE (S)
VOLUMETRIC AVE BOILING POINT, °F (t)
BOILING POINT CORRECTION, °F (t-t')
MEAN AVERAGE BOILING POINT, °F (t')

Fig. 3—Nomograph for determination of C/H ratios of petroleum fractions

where v is the viscosity at 122° F. in centistokes. Equation 6 was derived from the petroleum-fraction data used in Fig. 1 and the data of Watson, Nelson, and Murphy.[1]

The R factor calculated from t_v' and designated as R_v' can then be calculated from Equation 5. Equation 6 is again only applicable to petroleum fractions. For 18 samples for which sufficient data were available an arithmetic average deviation of t_v' from t' of 21° F. was observed. Comparable average deviations for a larger number of samples were calculated from literature data.[1]

Estimating carbon-hydrogen ratios from R factors.—The following equation was fitted to the plot of actual C/H ratios of pure hydrocarbons, binary mixtures of pure hydrocarbons and distillate petroleum fractions versus the R or R_v' factor (see Fig. 1):

$$C/H = 13.81 - 3.89 \log R \quad (7)$$

The modified equation for residual petroleum fractions fitted to the auxiliary plot of Fig. 1 is:

$$C/H = 12.74 - 3.36 \log R \quad (8)$$

Residual oils are defined here as oils with 50 per cent distillation points above 650° F.

The maximum deviation of the estimated C/H ratios for all classes of pure hydrocarbons covered in this investigation except for decalins and the lighter monoalkyl benzenes is approximately 0.8. Furthermore, most aniline-point values for alkyl naphthalenes and tetralins originally published by Petrov[12] and Petrov and Andreev[13] are reported to be 32° F. by Doss in "Physical Constants of the Principal Hydrocarbons"[11] and it appears that some of these values are not reliable. C/H ratios for some classes of pure hydrocarbons estimated by the U.O.P. K factor method[1] give such unsatisfactory results that no effort to compare the deviations by the two methods was made. The applicability of the original Cauley-Delgass correlation for pure hydrocarbons[2] is too limited (C/H from 5.29 to 6.98) to permit a comparison with the new correlation (C/H range from 5.2 to 10.4).

The deviations of estimated C/H ratios from actual C/H ratios for distillate and residual petroleum fractions using the U.O.P. K factor and R factor methods are summarized in Table 2.

The C/H ratios for oils of known mean average boiling point (t') and specific gravity at 60° F./60° F. (d) were obtained by the U.O.P. K factor method from the per cent hydrogen read off Fig. 6 of the paper by Watson, Nelson, and Murphy.[1] When only gravity and kinematic viscosity at 122° F. were obtainable, the U.O.P. K factor and average boiling point were estimated from Fig. 3 in the afore-

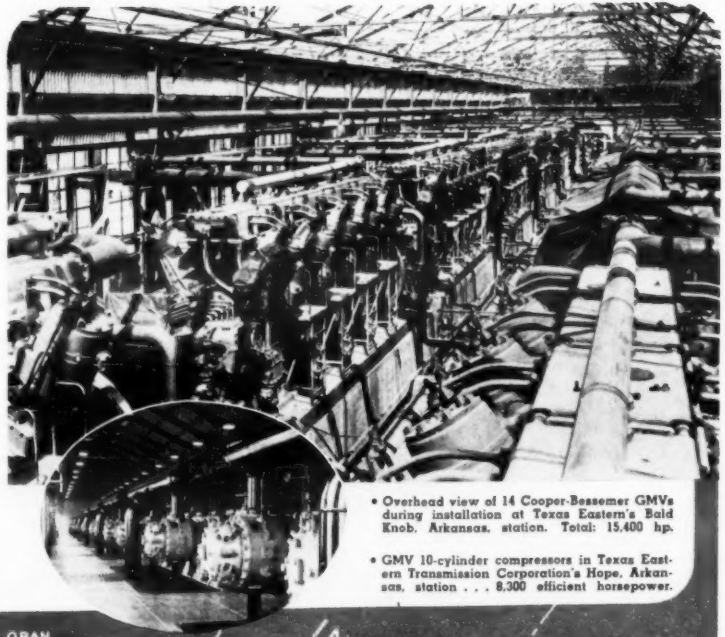
GMV Turboflow Saves Fuel For Big And Little Big Inch

As indicated on this map of the Inch line, 5 of the 7 new stations powered by reciprocating engine-driven compressors are GMV-equipped — a total of 46,900 Cooper-Bessemer V-angle hp.

Of particular significance, the GMVs most recently furnished (29 of the 44 now on the lines) are *Turboflows* — Cooper-Bessemer's latest gas-engine development, affording a full 10% increase in power output while reducing fuel consumption by at least 15%.

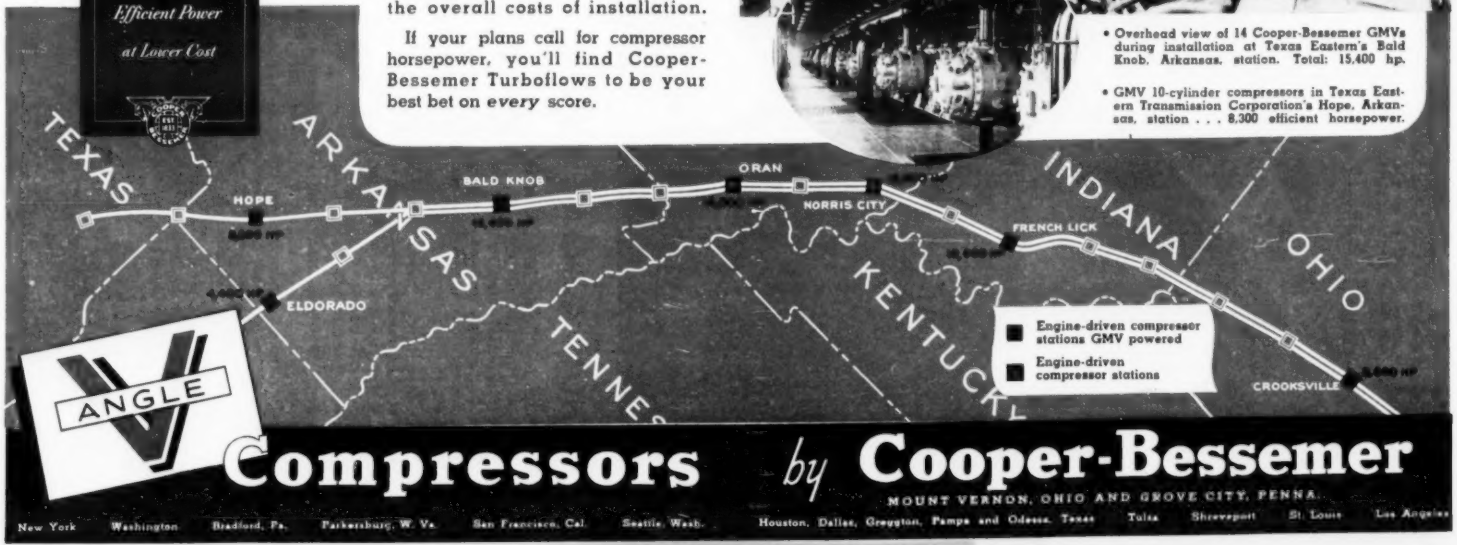
Today, more and more of the big gas lines are taking advantage of the new savings made possible by Cooper-Bessemer V-angle Turboflows. Unprecedented fuel economy and increased power output, obviously means big reductions in the overall costs of installation.

If your plans call for compressor horsepower, you'll find Cooper-Bessemer Turboflows to be your best bet on *every* score.



- Overhead view of 14 Cooper-Bessemer GMVs during installation at Texas Eastern's Bald Knob, Arkansas, station. Total: 15,400 hp.
- GMV 10-cylinder compressors in Texas Eastern Transmission Corporation's Hope, Arkansas, station . . . 8,300 efficient horsepower.

Another Example of Efficient Power at Lower Cost



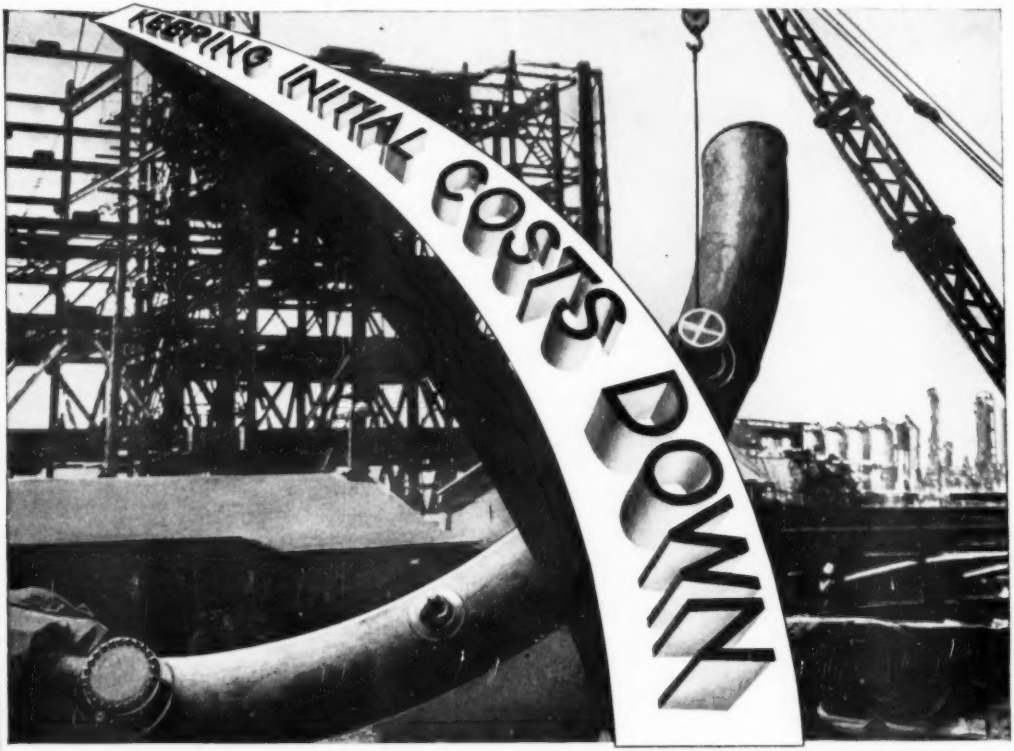
ANGLE V

Compressors *by* Cooper-Bessemer

MOUNT VERNON, OHIO AND GROVE CITY, PENNA.

New York Washington Bradford, Pa. Parkersburg, W. Va. San Francisco, Cal. Seattle, Wash. Houston, Dallas, Greygton, Pampa and Odessa, Texas Tulsa Shreveport St. Louis Los Angeles

N.B. While it is axiomatic that return on investment—the *ultimate earning power* of a refinery unit when actually on stream—is the only true evaluation of competitive engineering recommendations, initial plant costs remain a major factor in refiners' decisions on plant installations. M. W. Kellogg takes specific steps to *minimize initial plant costs* consistent with the achievement of *highest ultimate earning power*.



HOW A GIANT BENDER LOWERS "CAT" COSTS

In today's huge *Fluid* cat-crackers, catalyst lines are a transportation system for the equivalent of some 600 freight cars of material every 24 hour period. Fabrication of pipe big enough to handle this job (up to 60 inches in diameter) has always been time-consuming and expensive.

First, the curved pipe has always been tediously formed by welding together several, carefully-mitered sections. And then, the resulting irregular contour required the field-installation of wear plates to absorb erosion during on-stream periods.

To accomplish fabrication economies in this important part of the modern "cat", Kellogg's mechanical and metallurgical specialists produced something that had never been made before. They made *continuous one-piece* bends—in diameters up to 96 inches—by creating an *exclusive pipe-bending machine*.

All latitudinal welding, all special mitering is eliminated. In addition, because the insides of these new bends are smooth and in a continuous arc, wear plates are unnecessary . . . reducing field labor on just this one refinery part *by more than 50%*.

Thus the giant bender brings *initial savings* in addition to long-term protection . . . providing improved operating characteristics, radically lower maintenance costs and a reduction in down-time during turn-arounds.

This accomplishment could result only from pooling the talents and knowledge of an *integrated* organization, such as Kellogg, which includes fully-staffed groups versed in all phases of refining engineering, equipment fabrication and plant construction. Savings shown in this case history reflect only a small part of the overall opportunity for lowering costs, but they do emphasize that *completeness and integration* of the engineer-contractor are the soundest approach to LOW INITIAL PLANT COSTS.

THE M. W. KELLOGG COMPANY

A SUBSIDIARY OF PULLMAN, INC.

ENGINEERS TO THE PETROLEUM INDUSTRY

NEW YORK JERSEY CITY LOS ANGELES TULSA HOUSTON TORONTO LONDON PARIS

TABLE 2—COMPARISON OF METHODS FOR ESTIMATING C/H RATIOS

Method→	U.O.P. K	R	R_s	R_s'
Physical tests used	D, t, S or D, v	D, t, a	D, t, S	D, v
Number of samples	76	37	50	44
Arithmetic average deviation	0.14	0.11	0.10	0.10
Maximum deviations:				
Positive	0.42	0.23	0.32	0.27
Negative	0.54	0.34	0.47	0.26

mentioned paper. The actual U.O.P. K factor is defined as $(T')^{1/3}/d$. To calculate the C/H ratios, a total hydrocarbon content of 99 per cent for distillates and 98 per cent for residual oils was assumed.

Application of Correlations

In order to simplify the application of the proposed method for estimating C/H ratios of liquid hydrocarbons the required equations are presented in nomographic form. In Fig. 2, Equations 3, 7, and 8 are combined for estimating C/H ratios of pure hydrocarbons, binary mixtures and all types of petroleum fractions. In Fig. 3, Equations 5, 7, and 8 are combined for estimating C/H ratios of petroleum fractions only. The auxiliary nomograph of Fig. 3 represents Equation 1 and simplifies the determination of the mean average boiling point (t') from the 50 per cent distillation point (t) and the 10-90 per cent distillation slope (S). If the 90 per cent distillation point cannot be obtained for heavy oils although a vacuum distillation is used, the end point of the distillation may be substituted for the calculation of S expressed in °F./per cent distilled. Fig. 4 is a representation of Equation 6 for estimating t_v' in the absence of distillation data. The value of the mean average boiling point obtained from Fig. 4 (t_v') is then used in Fig. 3. The nomographs can also be combined for estimating aniline points of petroleum fractions.

Conclusions

In this investigation it was attempted to clarify the problem of the interrelationship of physical properties of liquid hydrocarbons with their chemical composition by a completely empirical approach. No new variables were introduced and only mathematical changes in already established functions were found necessary to correlate the data of most classes of liquid hydrocarbons and their simple and complex blends. Since it has been shown that apparently entirely unrelated properties of liquid hydrocarbons such as their heat of formation, heat of combustion, specific heat, and maximum flame temperature,[5,16] their gas-enriching value[11] and their smoke point[15] are all functions of the C/H ratio, a criterion based on simple physical tests which correlates with the C/H ratio is extremely valuable.

Acknowledgment

Thanks are due to E. S. Pettyjohn, director of the Institute of Gas Technology, and E. B. Delgass, of Socony-Vacuum Laboratories for their expert assistance in the investigation. The release for publication of this material by the Gas Production Research Committee of the American Gas Association is gratefully acknowledged.

Nomenclature

a = A.S.T.M. aniline point, °F.
a_s = estimated aniline point, °F.
C/H = carbon-hydrogen weight ratio
d = specific gravity, 60° F./60° F.
D = A.P.I. gravity
f = function
K = constant
R = R factor from a, D, t
R_s = R factor from D, t, s
R_s' = R factor from D, v
S = 10-90 per cent distillation slope, °F./per cent distilled
t = volumetric average boiling point, °F.
T = volumetric average boiling point, °Rankine
t' = mean average boiling point, °F.
T' = mean average boiling point, °Rankine
t_v', T_v' = estimated mean average boiling points, °F. and °R.
U.O.P. K = U.O.P. characterization factor, $(T')^{1/3}/d$
v = viscosity, centistokes at 122° F.

References

1. Watson, K. M., Nelson, E. F., and Murphy, G. B., Ind. Eng. Chem., 27, 1460 (1935).
2. Cauley, S. P., and Delgass, E. B., The Oil and Gas Journal, 45, No. 12, 166 (1946).
3. Cauley, S. P., and Delgass, E. B., The Oil and Gas Journal, 46, No. 11, 83 (1947).
4. Smith, R. L., and Watson, K. M., Ind. Eng. Chem., 29, 1408 (1937).
5. Linden, H. R., and Othmer, D. F., Chem. Eng., 54, Apr. 1947, p. 115.
6. Watson, K. M., and Nelson, E. F., Ind. Eng. Chem., 25, 880 (1933).
7. Ball, J. S., Nat. Pet. News, Tech. Sect., 36, R-297 (1944).
8. A.S.T.M. Standards on Petroleum Products and Lubricants, Oct. 1947.
9. Grace, R. J., and Gauger, A. W., Ind. Eng. Chem., Analytical Ed., 18, 563 (1946).
10. National Bureau of Standards, Circular No. C410.
11. Private Communication, Socony-Vacuum Laboratories.
12. Petrov, Bull. acad. Sci. (U.S.S.R.), Chem. Sect., 1941 (4-5), p. 553.
13. Petrov and Andreev, J. Gen. Chem. (U.S.S.R.), 12, 95 (1942).
14. Doss, M. P., "Physical Constants of the Principal Hydrocarbons," 4th Ed., 1943.
15. Eastwood, S. C., and Potas, A. E., Petroleum Processing, 3, 837 (1948).
16. Linden, H. R., and Othmer, D. F., Chem. Eng. 54, May 1947, p. 149.
17. Merkus, P. J., and White, A. H., Proc. A.G.A. (1934) 986.
18. Clarke, A. E., et al, J. Inst. Pet., 32, 627 (1946).
19. Borgstrom, P., Norton, R. D., and Lewis, O. I., J. Am. Soc. Naval Engrs., 46, 173 (1934).
20. Larsen, R. G., Thorpe, R. E., and Armfield, F. A., Ind. Eng. Chem., 34, 183 (1942).

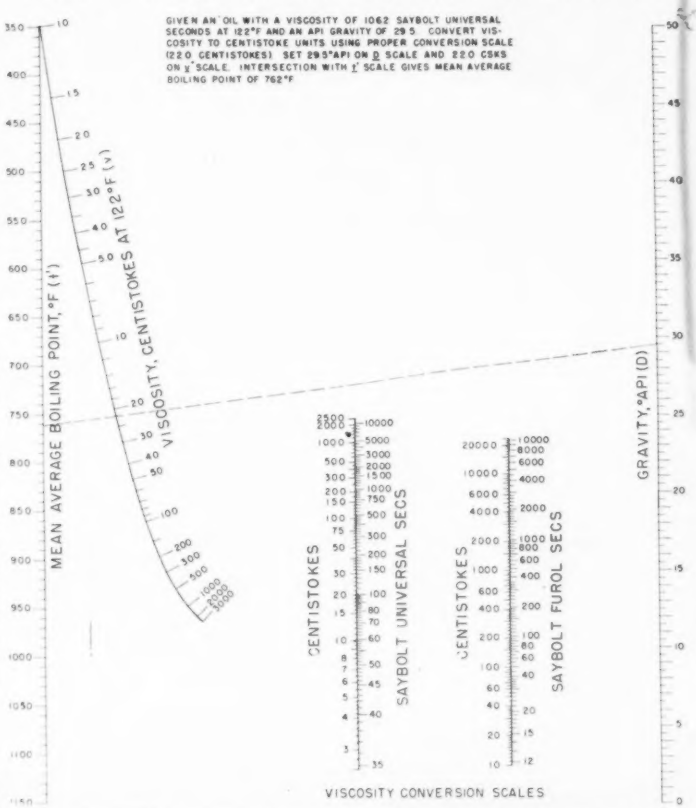
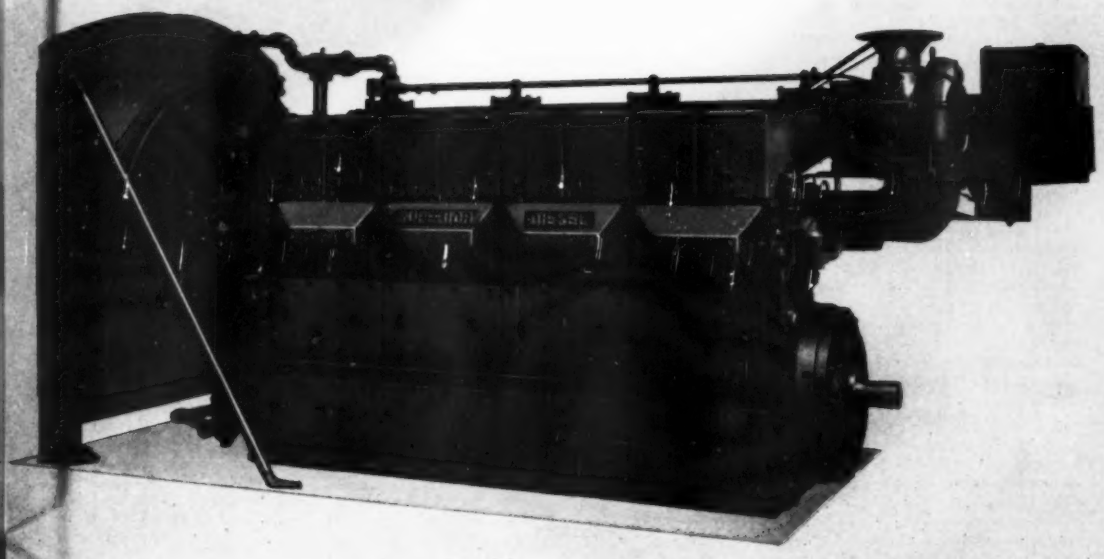

GIVEN AN OIL WITH A VISCOSITY OF 1062 SAYBOLT UNIVERSAL SECONDS AT 122°F AND AN API GRAVITY OF 29.5 CONVERT VISCOSITY TO CENTISTOKE UNITS USING PROPER CONVERSION SCALE (220 CENTISTOKES). SET 29.5°API ON D SCALE AND 220 CSKS ON ν SCALE. INTERSECTION WITH t' SCALE GIVES MEAN AVERAGE BOILING POINT OF 762°F
MEAN AVERAGE BOILING POINT, °F (t')
VISCOSITY, CENTISTOKES AT 122°F (ν)
GRAVITY, °API (D)
CENTISTOKES
SAYBOLT UNIVERSAL SECS
CENTISTOKES
SAYBOLT FUROL SECS
VISCOSITY CONVERSION SCALES

Fig. 4—Nomograph for estimating the mean average boiling point of liquid petroleum fractions

TWO GREAT OIL FIELD

NATIONAL

Built and designed these engines
***Exclusively* for Oil Field Service**



PTD DIESEL DRILLING ENGINE

available in 6 and 8 cylinder naturally aspirated and supercharged models. The naturally aspirated model can be equipped for dual fuel operation. The PTD series covers continuous service horsepower ratings from 280 to 620.

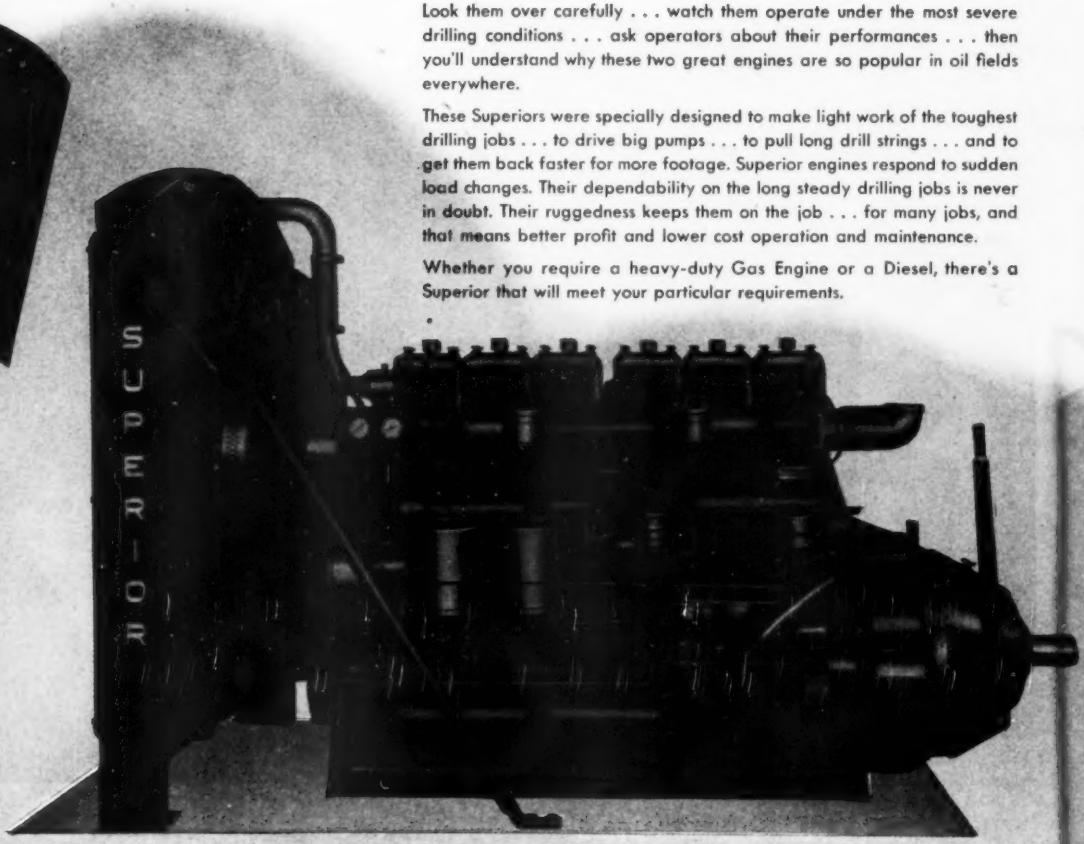
FOR DRILLING ★ *THE INDUSTRY'S MOST COMPLETE*

ENGINES . . .

Look them over carefully . . . watch them operate under the most severe drilling conditions . . . ask operators about their performances . . . then you'll understand why these two great engines are so popular in oil fields everywhere.

These Superiors were specially designed to make light work of the toughest drilling jobs . . . to drive big pumps . . . to pull long drill strings . . . and to get them back faster for more footage. Superior engines respond to sudden load changes. Their dependability on the long steady drilling jobs is never in doubt. Their ruggedness keeps them on the job . . . for many jobs, and that means better profit and lower cost operation and maintenance.

Whether you require a heavy-duty Gas Engine or a Diesel, there's a Superior that will meet your particular requirements.



6G-510 GAS DRILLING ENGINE

A strong, tough 300 hp distinctively designed engine that efficiently and economically fulfills the requirements of oil field service. Bulletin No. 315-A contains complete engineering data and construction details.

THE NATIONAL SUPPLY COMPANY

GENERAL SALES OFFICE: TOLEDO, OHIO

DIVISION OFFICES: CASPER; FT. WORTH; PITTSBURGH; TULSA; TORRANCE.
EXPORT: NATIONAL SUPPLY EXPORT CORPORATION, 30 ROCKEFELLER PLAZA, NEW YORK, N. Y., U. S. A. RIVER PLATE HOUSE, 12 SOUTH PLACE, LONDON, E. C. 2.

THE NATIONAL SUPPLY COMPANY — NSCO — NATIONAL BLUE PRODUCTS

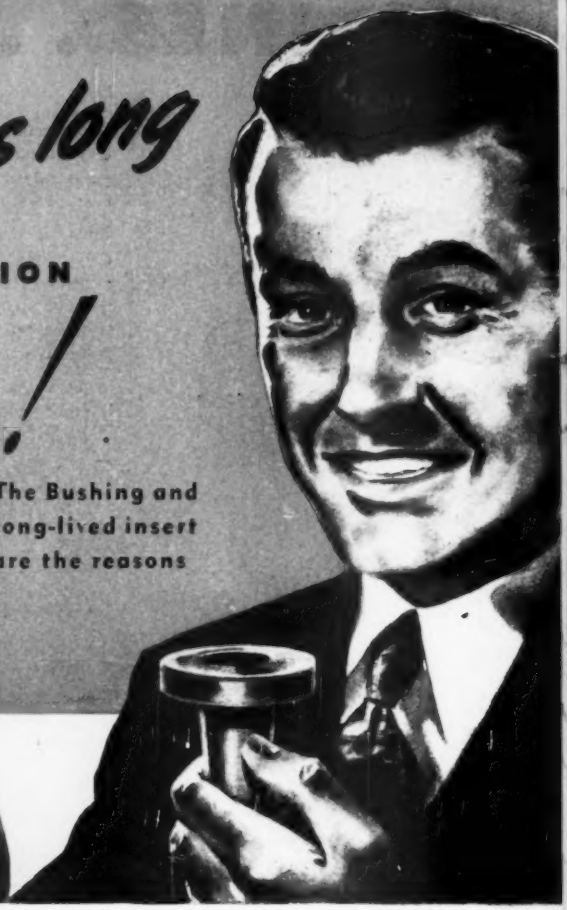
LINE OF OIL FIELD EQUIPMENT ★ FOR PRODUCTION

THIS VALVE OPERATES

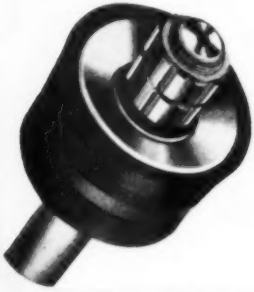
3 to 10 times as long

WITHOUT ATTENTION !

The Bushing and long-lived insert are the reasons



MISSION Slush Pump Pistons give longer trouble-free service



"3 to 10 times as long, without attention!" Can so strong a claim be true?

The figures are confirmed by hundreds of field records. The MISSION "Compound 308" Insert lasts 3 to 5 times as long as regular inserts in ordinary mud, and up to 10 times as long as ordinary oil-resisting inserts in hot, chemically treated or oil-base mud.

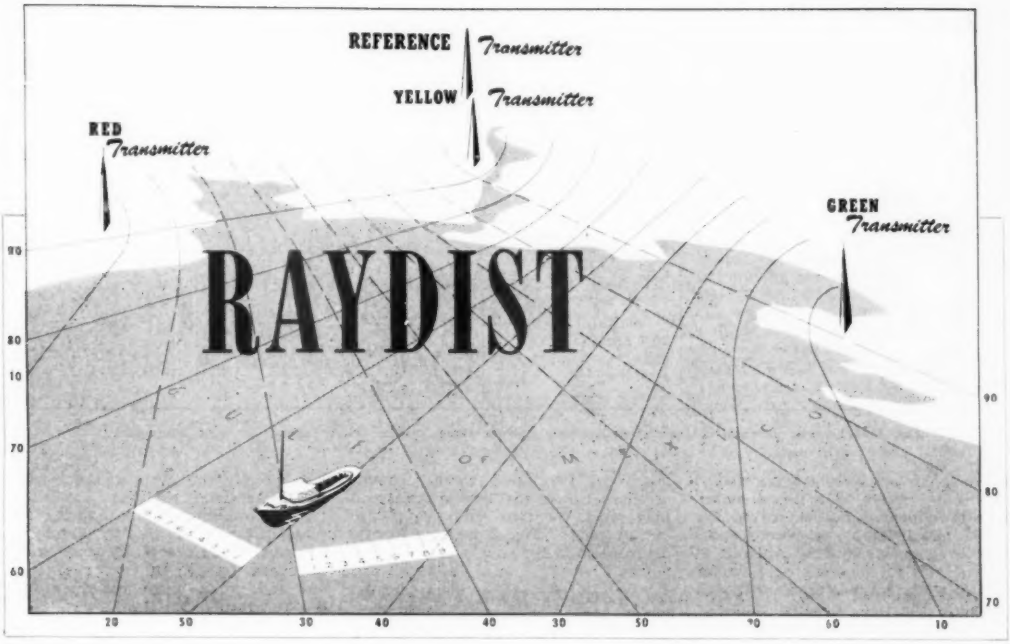
The MISSION Replaceable Valve Seat Bushing works hand in glove with the insert to avoid interruptions of drilling. The life of the bushing, which protects the seat from wear, approximately equals that of the insert. When you install a new insert, install a new bushing. This gives you practically a new valve, which should again require servicing only when the insert again wears out.

The MISSION Valve has extra-large sealing surface and ample fluid passage, and operates with top efficiency. It handles with ease even the most difficult muds, including oil-base muds and those containing cotton seed hulls, abrasives, etc. It is guaranteed to prove more economical than others, or money refunded.

MISSION MANUFACTURING CO. . . Houston 14, Texas
Export Office: 30 Rockefeller Plaza, New York 20, N. Y.

Mission SLUSH PUMP VALVES

. . . have a *mission* . . . to save you money!



A METHOD OF SURVEYING BY USE OF RADIO WAVES

by Charles J. Deegan
Associate Editor

THE "Raydist" method of surveying uses radio waves to find the geographic position of locations. In other words, radio waves, plus some electrical measuring devices, are used to do the same job the ordinary surveyor does with a transit plus a steel measuring tape. Raydist, in its present form, was developed by Hastings Instrument Co., Inc., of Hampton, Va., for surveying and navigation applications.

Frost Geophysical Corp., of Tulsa, has received an experimental license and frequency allocations from the Federal Communications Commission for use of Raydist in the control of geophysical work in the Gulf of Mexico, and has assigned this license to a company newly formed to provide surveying services, Raydist Navigation Corp.

The basic principle of all radio surveying methods is simple. You can of course measure distance by measuring the length of time it takes a wave to travel between points. You can do this because all radio waves travel at the constant speed of 186,000 miles per second (the same speed as light). If you know how long it took a wave to travel from one point to another, you figure that amount of time at the rate of 186,000 miles per second. The answer is the distance between the two points.

Obviously you would have to spilt a second up into extremely small fractions to measure ordinary distances with something that travels 186,000 miles in 1 second. So, in Raydist, the surveyors make no attempt to measure time by direct means. They do it indirectly, using equipment and methods that are fairly complicated. But the basic ideas are reasonably simple, and this article will attempt to explain them in nontechnical language.

You know from listening to your radio at home that when you pick up two stations too close together on your dial, you get an interference squeal, technically known as a heterodyne wave, and sometimes called a beat note. That kind of a squeal is a basic part of Raydist. In Raydist you deliberately manufacture radio interference beat notes at three known points on land. These heterodyne waves are then broadcast to your boat out on the water.

Let's make it easier to remember by calling these three land points red (on the left); yellow (in the center); and green (on the right). (See Fig. 1.) On your boat you have three radio receivers, each one tuned to one of the land points. One receiver picks up the beat note from the red broadcasting station, one from the yellow, and the third from the green station.

The three radio receivers on the boat are connected to two phase meters. Since the yellow (center) receiver is connected to both meters, let's call one meter the red, and the other the green. The red receiver is connected to the left-hand side of the red phase meter; the yellow receiver connects to the right-hand side. The yellow receiver also hooks up with the left-hand side of the green phase meter; while the green receiver is connected to the right-hand side. (See Fig. 1.)

The principle of a phase meter is not too hard to understand. It works like this: Two radio waves starting from different points but arriving at the same destination at the same time are like two soldiers marching down the street. The soldiers are either in step, or out of step. So are the radio waves, but with radio waves, you say they are either in phase, or out of phase.

If the soldiers are in step, there is only one sound as both left or both right feet hit the ground. If they are out of step, you hear two sounds.

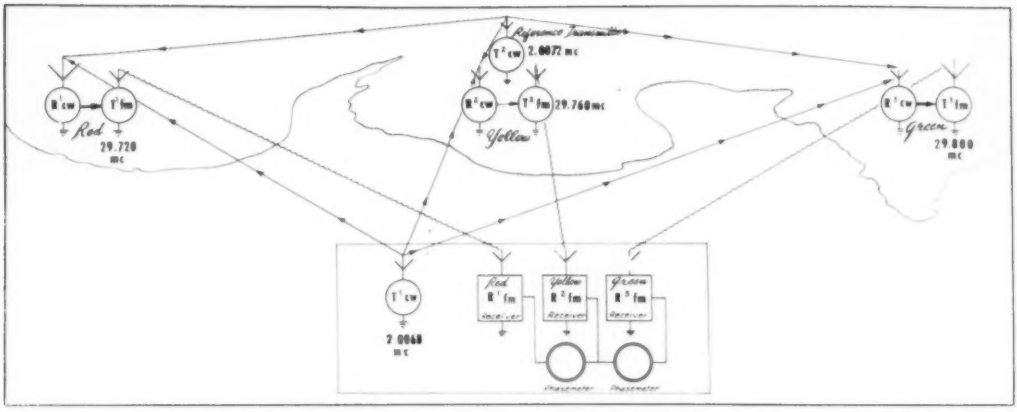


Fig. 1—Schematic diagram of Raydist transmitting and receiving system; lower square is boat equipment

If two radio waves are in phase (step) when they arrive at a phase meter, nothing happens. If the waves are out of phase (step), an electric current is generated. The amount of current you get depends on how far the two waves are out of phase (step).

When you have electric current, you can turn an electric motor with it. How far you can turn the motor depends on how much current you have to turn it with. The "motor" in a phase meter consists of two coils—one fixed and one which can revolve. These coils will always try to remain in a balanced position. When two waves arrive out of phase, sufficient current is generated to move the revolving coil to a new position where it is again in balance with the fixed coil. The revolving coil is fastened to a shaft.

Slip a clocklike dial face over the shaft, and fasten a pointer to the outside end of the shaft. Fasten the dial face so that it does not turn with the shaft. When the motor shaft turns, the pointer turns (like the minute hand on a clock) but the dial face remains stationary. Now if any current is generated, the motor shaft will turn until the two coils are again in balance. But the distance the pointer moves depends on how much the two radio waves are out of phase. So the dial reading tells you how much the two radio waves are out of phase. Fig. 2 is a schematic diagram showing how a phase meter works.

You now understand what a phase meter does. You also know that on land there are three broadcasting stations (red, yellow, and green) and sending out radio beat notes, or heterodyne waves. You know that you are getting these waves (red, yellow, and green) at separate receivers on your boat. You know that the red phase meter is measuring the amount, if any, that the red wave is out of phase with the yellow wave. Your green phase meter is measuring the amount, if any, that the green wave is out of phase (step) with the yellow wave. What good does that do you?

Using Phase Differences

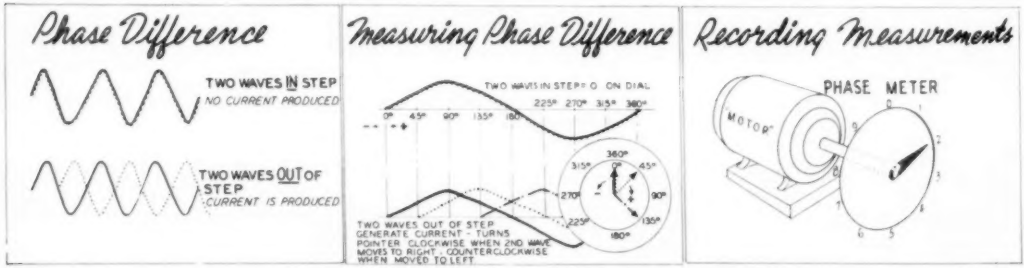
Let's take a look at the land stations for a moment, then come back to the boat. The three land stations (red, yellow, and green) start their heterodyne waves (beat notes) out at the same instant. All waves travel at exactly the same speed.

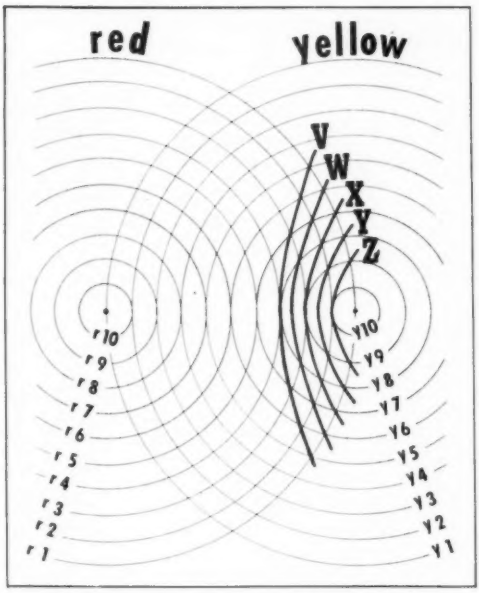
Now back to the boat. If your boat happened to be at some point that was exactly the same distance from all three land stations, the three waves would arrive at exactly the same instant from all three land stations and, therefore, all three would be in phase (step). In that case both red and green phase meters would register zero.

But most of the time the boat will be at some point that is a little farther away from one station than it is from the others. Then the wave from the nearest station will reach the boat a split second ahead of the other waves, because it doesn't have to travel so far. That won't bother the phase meters. If red and yellow waves don't reach the boat at quite the same instant, the red phase meter tells you how much out of phase they are. If the green and yellow waves don't arrive at quite the same instant, the green phase meter does the measuring. If all three waves, red, yellow, and green, arrive at different times, the red phase meter tells you how much the red and yellow are out of step; the green meter tells you how much the green and yellow are out of step.

If there was just some way to put a number tag on every wave as it was broadcast from the land station, the rest of the problem would be

Fig. 2—Two radio waves received at a common point from different sources will arrive either "in phase" (in step) or "out of phase." If out of phase they will generate a current which can be measured by a phase meter


Phase Difference
TWO WAVES IN STEP
NO CURRENT PRODUCED
TWO WAVES OUT OF STEP
CURRENT IS PRODUCED
Measuring Phase Difference
TWO WAVES IN STEP = 0 ON DIAL
0° 45° 90° 135° 180° 225° 270° 315° 360°
TWO WAVES OUT OF STEP GENERATE CURRENT - TURNS POINTER CLOCKWISE WHEN 2ND WAVE MOVES TO RIGHT, COUNTERCLOCKWISE WHEN MOVED TO LEFT
Recording Measurements
PHASE METER
MOTOR



HYPERBOLAS FORMED BY IN-PHASE POSITIONS OF RED AND YELLOW TRANSMITTER RADIO WAVES

Line V	Line W	Line X	Line Y	Line Z
5Y—1R—4	6Y—1R—5	7Y—1R—6	8Y—1R—7	9Y—1R—8
6Y—2R—4	7Y—2R—5	8Y—2R—6	9Y—2R—7	10Y—2R—8
7Y—3R—4	8Y—3R—5	9Y—3R—6		
8Y—4R—4				

Fig. 3—Radio waves from two stations illustrated above are in phase at intersection of the circles. The points of intersection (or in phase status) when connected, form hyperbolic lines as indicated in part above. (Check definition of hyperbola in dictionary.) The lengths of the radio waves are known (so the difference in radii of both sets of lines 1 to 10 are known). Knowing the geographic positions of the two stations, and the wave lengths, it is possible to compute the points of intersection and draw these hyperbolas on a base map

simple. But since nobody has figured out yet how to hang a number tag on these waves, you have to devise an indirect method. As it stands now, all you can do on the boat is tell whether any two waves are in phase, or if out of phase, how much. Your indirect method has to get the answers somehow out of that information.

So, let's go back to the three land stations — red, yellow, and green. You know exactly where each station is located, and have it spotted on an accurate base map. You also know the exact length of each radio wave, and therefore the distance from the beginning point of one wave to the beginning point of the next.

Now start with the red (left) land station, and from that known point, draw a series of circles exactly one-half wave length apart. Then start from the yellow (center) land station, and draw another series of circles exactly one-half wave length apart. These circles represent radio waves, and when you have drawn enough circles the two sets will cross each other. (See Fig. 3.) The radio waves from the red and yellow stations will be in phase (step) at every point where two circles cross each other.

You are getting a little closer to solving your problem now. The red phase meter on your boat will tell you every time you reach one of those circle intersections. But it can't tell you which one. They are all alike to the phase meter, just places where red and yellow waves are in phase. So, you have to do something else.

Take another look at Fig. 3. Suppose you draw lines like "V-V," "W-W," "X-X," "Y-Y," and "Z-Z" that will connect the points where the circles intersect. Now write down the circle (wave) number for each point along any one of these lines. If you subtract these numbers, e.g., "V-V," you get Yellow 5 minus Red 1 equals 4; Yellow 6 minus Red 2 equals 4; Yellow 7 minus Red 3 equals 4; etc. All the points along that line give you the same difference, 4. Jump over to the line "W-W" and do the same thing. All points on that line give you a difference of 5; "X-X" line gives a difference of 6, etc.

On line "V-V," that difference of 4 means that every point along "V-V" is four half wave lengths closer to the yellow land station than it is to the red land station. The first four yellow waves had gone by before the first red wave arrived to meet yellow wave number 5, etc. On line "W-W," the points are five half wave lengths closer to the yellow station than to the red station.

Using Hyperbola Lines

Now look closely at Fig. 3. If you move the boat from line "V-V" to line "W-W," then to "X-X," etc., you are moving only one-half wave length at a time. Every time the boat moves from one of these lines to the next, the phase meter makes one complete revolution. It is in phase as you start to leave one line, it goes out of phase and comes back in as you reach the next line.

So, you can tell every time your boat moves from one of these lines to the next. Now suppose you draw these lines in red on your base map. You can do this accurately because you know the radius of each circle. Then put numbers on these lines on the map. Add a counting device to your red phase meter, with the same numbers you used on the map lines. Gear it so that every time the pointer makes one complete turn, your counter adds or subtracts one number.

The boat is based at some port, you know the location of that port on your map, and the map has these numbered lines drawn on it. One of these numbered lines passes close to

(Continued on page 90)

Fig. 4 — Phase-meter dials on boat equipment from which position is read and plotted

QUESTIONS on TECHNOLOGY

by W. L. Nelson

Consulting Engineer

This department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in various phases of plant operation, as well as those connected with the marketing and utilization of petroleum products. Readers are invited to submit their problems to W. L. Nelson, technical editor. Inquiries must be signed, but only the initials will be printed.

Refinery Engineering—Jobs

What kinds of work are available to refinery engineers in petroleum refineries?—W. R. P.

The following general job classification is listed by one large refiner as jobs that may be filled by chemical or refinery engineers:

Supervisor of engineering	1
Design engineers	10
Refinery superintendent	1
General superintendent of refinery	1
Supervisor of costs and yields	1
Supervisor of plant processing	1
Junior engineers under plant processing	30
Assistant manager of research development	1
Superintendent of gas and acid	1
Assistant in gas and acid development	1
Assistants in light-oil treating	5
Assistants in heavy-oil treating	4
Technical salesman	1
Inspection superintendent	1
Assistant inspectors	2
Manager of industrial relations	1
Supervisor of economics	1
Economic analysts	6
Assistant supervisor of automotive department	1
Patent attorney	1
Total	71

In addition, this company employs 9 chemists in executive positions and 35 junior chemists. Additional sources of information are (1) The Oil and Gas Journal, September 12, 1940, page 67, and (2) Chemical & Metallurgical Engineering, June 1940, page 416.

TABLE 2—TITLES OF JOBS UNDER SOME OF THE JOB CLASSIFICATIONS

(Mainly of interest to refinery engineers)

Engineering, 6.6 per cent:
- Industrial engineering, 0.4 per cent:
  - Instrumentation engineer
  - Safety engineer
  - Safety inspector
- Structural engineering and drafting, 0.2 per cent:
  - Draftsman, oil and gas
- Chemical (or refinery) engineering, 2.8 per cent:
  - Blending coordinator
  - Head design engineer
  - Refinery design engineer
  - Engineering—laboratory foreman
  - Lines-and-tankage layouts coordinator
  - Manager research
  - Process engineer (over 0.2 per cent)
  - Refinery chief
  - Softening plant, chief operator
  - Pilot-plant operator (over 0.2 per cent)

Managerial work, 2.3 per cent:
- General manager
- Production manager
- Refinery manager
- Maintenance superintendent

Chemists, materials analysis, 7 per cent:
- Chief chemist
- Refinery chemists (over 0.2 per cent)
- Specialty chemist
- Chief research chemist
- Physical chemist
- Metallurgist
- Laboratory chief
- Laboratory foremen (over 0.2 per cent)
- Column operator
- Crude column operator
- Fuel research-engine operator
- Podbielniak operator
- Testers (over 0.2 per cent)
- Tester helpers (over 0.2 per cent)
- Test-engine evaluator
- Test-engine operator

TABLE 1—DISTRIBUTION (PER CENT) OF WORKERS IN PETROLEUM REFINERIES (1945)

	Complete refineries	Lube oil refineries*	Gasoline refineries†
Business relations work	10.2	11.4	16.1
Public, personnel and protective services	3.8	3.6	6.8
Agricultural, marine, and forestry work	0.2		
Engineering:			
Industrial engineering	0.4	0.2	0.4
Structural engineering and drafting	0.2		0.2
Surveying, map making, and civil engineering	0.1		
Mechanical engineering and drafting	0.7	0.3	0.7
Chemical (or refinery) engineering	2.8	0.5	1.8
Electrical engineering and drafting	0.1		
Industrial supervision	2.3	5.3	4.6
Mechanical repairing	9.9	7.8	8.9
Structural work	19.9	11.9	9.7
Bench work	3.5	3.0	2.1
Machine operating	11.4	16.6	4.3
Graphic art work	0.1		
Processing:			
Mixing, compounding, extracting, etc.	0.7	1.3	0.2
Nonmetal kiln operation, etc.	0.1		
Simple nonmetal furnace and boiler tending	0.9	0.5	1.9
Miscellaneous process work	1.7	1.7	2.2
Metal heating	0.1		
Chemical or gas production	0.5		0.3
Petroleum refining	7.3	10.5	3.1
Distilling	4.0	9.3	17.6
Elemental work	12.1	11.4	11.4
Chemists—materials analysis	7.0	4.7	7.7

*Eight representative refineries, 32 to 425 workers. †Twelve representative refineries, 40 to 760 workers.

A complete study was published by the United States Employment Service, Department of Labor, in 1946, entitled, "Occupational Composition Pattern for Petroleum Refining" (a part of Industry Code 2911, Standard Industrial Classification Manual, Bureau of Budget, 1945). All workers in a refinery are indicated in Table 1. The titles of more important job classifications are shown in Table 2.

Hazards of Sulfuric Acid

What precautions should be taken in the handling of sulfuric acid?—R.E.P.

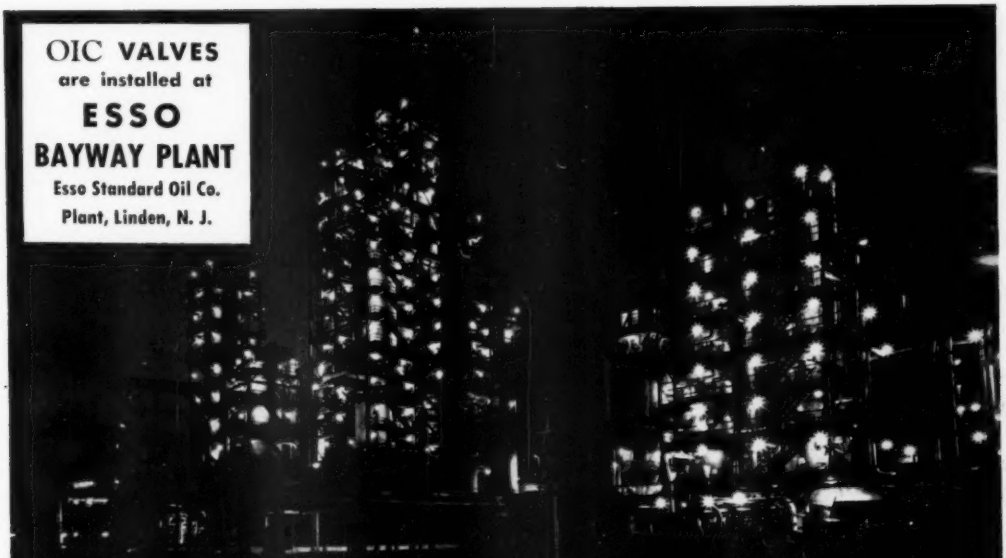
Sulfuric acid has been so widely used and for so many years in petroleum refining that little is published on the subject. Perhaps the best source of information is the A.P.I. Toxicological Reviews, Department of Safety, American Petroleum Institute, 50 W. 50th Street, New York.

Sulfuric acid is an active dehydrator and hence it extracts water from animal tissues or plant fibers and upon longer contact chars or dissolves most living organic materials. Acid spills should be diluted with water or buried. Acid on the skin or in the eyes should be washed away with large volumes of water, meanwhile having lime water prepared or lime water and raw linseed oil mixed in equal proportions. (Plain limewater is used as an eyewash). Mixtures of baking soda with water are also used. If taken internally, magnesia, alkali carbonates, albumen, soapy water, and medicinal oil are used as antidotes.

Hydrogen is sometimes generated in acid-storage tanks or lines by contact with metals and hence flames or lights should be kept out of the acid area. Lines should be located aboveground so that they can be handled with ease and for aid in detecting leaks. However, the lines should be arranged so that they do not trip the workmen in emergencies. Water lines and hoses should be readily available.

The Manufacturing Chemists Association of the United States also has a series of Chemical Safety Data Sheets (608 Woodward Building, Washington, D.C.)

OIC VALVES
are installed at
ESSO
BAYWAY PLANT
Esso Standard Oil Co.
Plant, Linden, N. J.



Another Installation where

OIC
SETS THE PACE
IN VALVES

THERE's a growing demand for OIC Valves in the petroleum field. The job of directing and controlling America's most precious fluids demands valves that function with absolute precision and safety for long periods of time.

Recognizing this, OIC selects materials, both for trim and for pressure-containing parts, with the utmost consideration for their utility over the wide range of applications for which the valves are recommended. In addition to the standard trim materials, special trims and combinations of trims for special application are available.

Advanced design features make OIC Valves *pace-setters* of the field!

See Your OIC Distributor for Prompt, Efficient Service

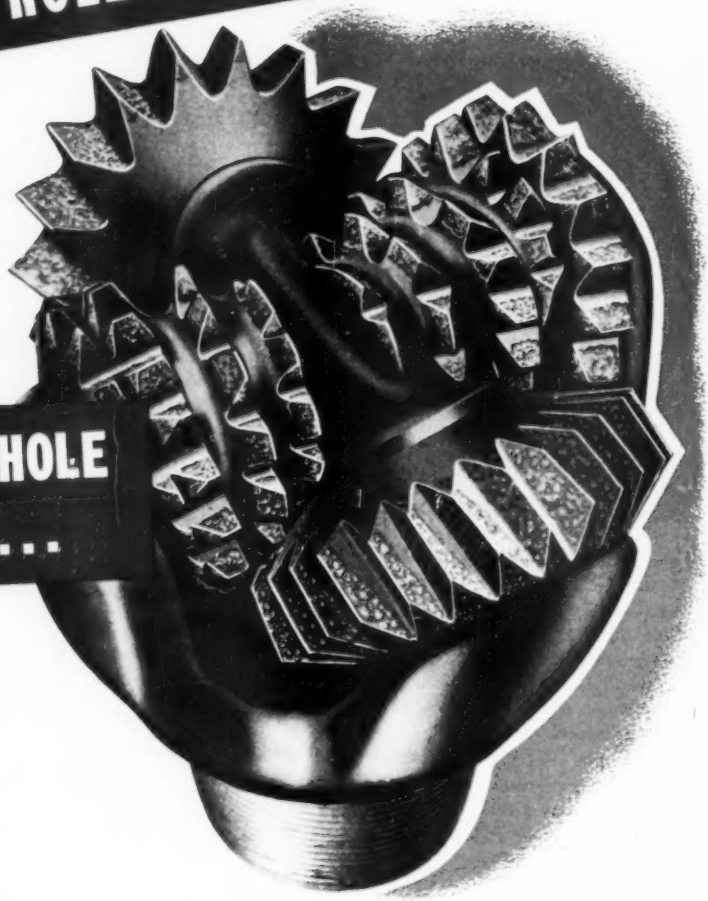
GET YOUR FREE COPY OF THE FAMOUS OIC CROSS REFERENCE CHART!

Eliminate your valve replacement problems with the OIC Cross Reference Chart. Simply check the number of the valve on the line, turn to the chart, and find the correct OIC Valve to replace it. Send your request to *The Ohio Injector Company, Wadsworth, Ohio.*

OIC
VALVES
STEEL • IRON • BRONZE

0-249-16

Get **STRAIGHTER HOLE...**



AND MORE HOLE PER BIT...

with

REED ROCK BITS

BE SAFE WITH REED

Reed ROLLER BIT COMPANY

HOUSTON 1, TEXAS

West Poison Spider Discovery Well's

DRILLING AND COMPLETION PROBLEMS

by L. L. McDonald*

IN the center of NW SE 11-33n-48w, Natrona County, Wyoming, a location was staked on July 18, 1947, which was destined, some 11 months later, to establish a world's record depth for oil production. Designated as Pure Oil Co.'s West Poison Spider Unit No. 1, it produced on June 4, 1948, 836 bbl. of 43.9° A.P.I. gravity oil and 1,730 M.c.f. of gas from the Frontier sand at a total depth of 14,309 ft.

As is the case with any deep wildcat well, many interesting problems were encountered—ranging from the problem of the geologist who first considered the area to be one of interest to problems of the drilling and production superintendents up to the time the well was turned into the tanks. These will be briefly discussed under the various headings following.

*Division production engineer, Pure Oil Co., Rocky Mountain producing division, Billings, Mont. Paper presented at spring meeting of the Rocky Mountain district, A.P.I. Division of Production.

Geological

Pure Oil Co. assembled a block of 50,000 acres in Natrona County in December 1946 as a result of a seismograph survey, taken because a reconnaissance surface study and some widely scattered subsurface information indicated the area to be one of interest.

The closest known production was at South Casper Creek and the Poison Spider fields approximately 5 miles east where the Muddy, Sundance, and Tensleep horizons produce oil and gas from relatively shallow depths.

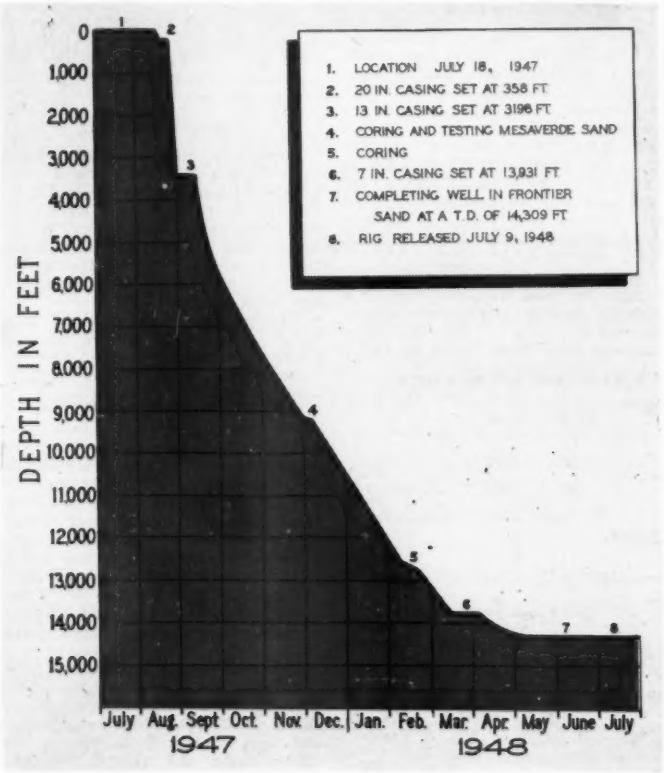
Between the old producing area of Poison Spider and the West Poison Spider area, Pure geologists were of the opinion there was a large structural disturbance which prevented their making any reasonable estimate of the depth at which any given horizon at West Poison Spider might be expected.

Accordingly, it was deemed advisable that the well be watched very carefully during the drilling to prevent passing any possible producing horizon. To carry out this program, a contract sample service was put on the well in addition to two company geologists.

The Mesaverde sand in this area was considered a possible producing horizon mainly because of the large oil seep in a sand in that formation (Phayles reef) approximately 15 miles to the west on the flank of the Rattlesnake Mountains. What might be encountered in horizons shallower than the Mesaverde was entirely unpredictable, but it was believed the possible chance of encountering something of interest was sufficient to justify careful watching. During the drilling of the well, the first show which was considered to be of any consequence was encountered at 9,135 ft. where the cores looked promising, but a drill-stem test failed to show fluid of any kind. It was believed this sand was in the Mesaverde and later drilling proved this to be correct. The top of the Mesaverde is very difficult to determine so an arbitrary top was called at 7,280 ft. Below the show at 9,135 ft. several more shows were encountered in the Mesaverde section but were not tested.

The top of the Cody shale was encountered at 9,800 ft. Sands were encountered at 10,230 and 10,365 ft., which had slight shows but were not tested. At 13,790 ft., the top of the Frontier formation, considerable gas and oil show was evident in the mud so 7-in. casing was run. Drilling ahead below the pipe, a sand was encoun-

Fig. 1—Drilling-time curve for West Poison Spider 1 Unit, record-depth producing well



tered at 14,191 ft. which was carrying oil and gas. The hole was deepened to 14,309 ft. and remained in sand of varying degrees of porosity and permeability from 14,191 to 14,301 ft.

The West Poison Spider Unit is located along Poison Spider Creek in the southeast corner of the Wind River basin. The name Poison Spider, according to oldtimers, originated when a sheepherder, while resting on a natural rock chair, was fatally bitten by a black widow spider. This, plus the Rattlesnake Mountains on the south, would indicate that at least in name the location would be decidedly unhealthful.

The discovery well, Unit No. 1, is located approximately 30 miles west of Casper. Surfaced county roads extended to the old Poison Spider field but it was necessary for the company to gravel an additional 7 miles of county road and to build a new road for the last ¾ mile to permit moving rig equipment to the location.

Two water wells were drilled to approximately 300 ft. and one 1,500-bbl. and one 400-bbl. tank were set to store water for drilling. The company supplied a 30-ft. base, 136-ft. high, 800,000-lb. capacity, A.P.I. derrick on a 30-ft. by 7-ft. 3-in., 1,000,000-lb. corner capacity A.P.I. substructure.

Rig Equipment

The drilling contractor used a consolidated rig with a rated depth capacity of 12,500 ft. with 4½-in. drill pipe. It was equipped with three six-cylinder 260-hp. diesel engines, a 7¾ by 18-in. and a 7¼ by 15-in. duplex power slush pumps and a 40-hp. gas-fired boiler for heating purposes using fuel from utilities-company pipe line in the area.

Four and one-half inch, 16.60-lb. Grade E drill pipe was used in drilling to a depth of 13,840 ft. Below this depth, 2⅞-in., 10.20-lb. internal flush, special high-tensile drill pipe was used to total depth. Blocks were sheaved for 8 lines to a depth of 11,196 ft., where they were resheaved to 10 lines.

Referring to the drilling curve, Fig. 1, it will be noted that a total rig time of 346 days elapsed from date rigging up commenced until date rig was released and that drilling progress was continuous except for the time preparing hole for and setting casing. Very little time was lost during the drilling of this well from either fishing jobs or lost circulation. Twelve and three-quarters hours were spent fishing for four drill collars at a depth of 9,098 ft., but this fish was readily recovered with an overshot. Later, bit cones were lost twice, but these were milled up and washed by with some cuttings recovered in junk basket.

Lost circulation is often very troublesome and expensive in drilling in the Rocky Mountain area, but fortunately at West Poison Spider Unit No. 1 this trouble was minor. Circulation was lost twice during the drilling of the well but was reestablished after the addition of lost-circulation materials.

Bit requirements totaled 150 rock bits varying from 5⅞ in. in diameter to 12¼ in., 10 reaming bits 17¼ and 24 in. in diameter, and 26 core bits from 5½ to 7½ in. in diameter. The 12¼-in. hole was carried to 9,172 ft. so that a 9⅝-in. casing string could be run if required.

Drilling Mud

Below the 13⅜-in. surface pipe set at 3,198 to 9,392 ft., native mud conditioned with bentonite plus a light treatment of caustic soda—quebracho for viscosity control was used which averaged 10.1 lb. per gallon, 40 seconds A.P.I. funnel viscosity, and 9.75 cc. A.P.I. filter loss. From 9,392 to 13,840 ft., a preservative starch mud was used with an average weight of 10.1 lb. per gallon and 70 seconds A.P.I. funnel viscosity and 3.66 cc. A.P.I. filter loss.

Before drilling the plug in the 7-in. casing, the mud was converted to a high-ph—caustic soda — quebracho — lime—starch mud. Average mud characteristics from 13,840 to 14,132 were: weight, 10.4 lb. per gallon, 45 seconds A.P.I. funnel viscosity and 3.6 cc. A.P.I. filter loss.

While drilling at 14,250 ft., mud in the hole started flowing up around drill pipe and flowed 15 ft. above rotary table. Blowout preventer rams were closed and pressure on drill pipe built up to 1,550 psi. The pressure was relieved and while circulating 14-lb.-per-gallon mud with a viscosity of 70, returns at the beginning weighed 5.3 lb. per gallon but gradually built up to 10.4 lb. per gallon with a viscosity of 72 seconds. Some mud was lost to the formation with this heavy mud so the weight was gradually lowered. From 14,200 ft. to total depth the mud averaged 13.2 lb. per gallon, 47 seconds A.P.I. funnel viscosity, 3.0 cc. A.P.I. filter loss.

The chief mud trouble experienced while drilling was gas cutting of the mud resulting in reduction of weight and building up of viscosity. Installation of a steam-jet-actuated vacuum tower for the purpose of degassing the mud was found to be satisfactory in its performance. Over eleven 40-ton carloads of mud-conditioning materials were required. These are itemized as follows: bentonite, 82,700 lb.; caustic soda, 7,660 lb.; quebracho, 8,600 lb.; starch, 62,300 lb.; starch preservative, 23,260 lb.; barytes, 697,700 lb.; lime, 700 lb.; cellophane foil, 1,100 lb.

This quantity of mud-conditioning materials used is readily accounted for when it is realized that 2,200 bbl. of mud were required to fill the hole and surface pits.

Coring and Logging

Twenty-six cores were cut, using a conventional core barrel with core-bit sizes ranging from 6¾ to 7½ in. for the 20 cores taken prior to setting 7-in. casing and 6 core bits of 5½ in. and 5⅝-in. size taken below the 7-in. casing. The cores obtained were 2⅞ in. in diameter with recovery being 81.6 per cent.

Electric logs were obtained from below the conductor pipe to total depth and radioactivity logs were obtained from 8,500 ft. to total depth.

Casing Program

The casing program is tabulated in Table 1. It will be noted that 20-in. conductor pipe was set at 358 ft. and 13⅜-in., 68-lb. J-55 surface pipe set at 3,198 ft. Cement was circulated to the surface for both of these strings. An engineered combination weight 7 in. o.d. N-80 oil string was set at 13,751 ft. and cemented with 400 sacks of cement. For this string safety factors were: collapse, 1⅛; joint strength, 1¾; internal pressure, 1; tensile yield, 1¾.

Two float collars in addition to the float shoe were used and the casing was filled with mud as run except for the top 4,000 ft. which was floated and then filled with mud when the casing string was landed. The total

TABLE 1—COMPLETION EQUIPMENT FOR WEST POISON SPIDER UNIT NO. 1

Casing Program

Size, in. o.d.	Description—	Set at (ft.)	Sacks cement	Hole size, in.
20	65.71 lb. P.E. Line Pipe	358	500	24
13⅜	68 lb. J-55 8-R Thd. SS	3,198	2,480	17¼
7	29 ft. LI.U., 29, 32, and 35 lb. Reg. 8-R Thd. N-80 SS LT&C	13,791	400	12¼ to 9,172 ft. 9⅞ to 9,392 ft. 9 to 13,840 ft.

Production Packer

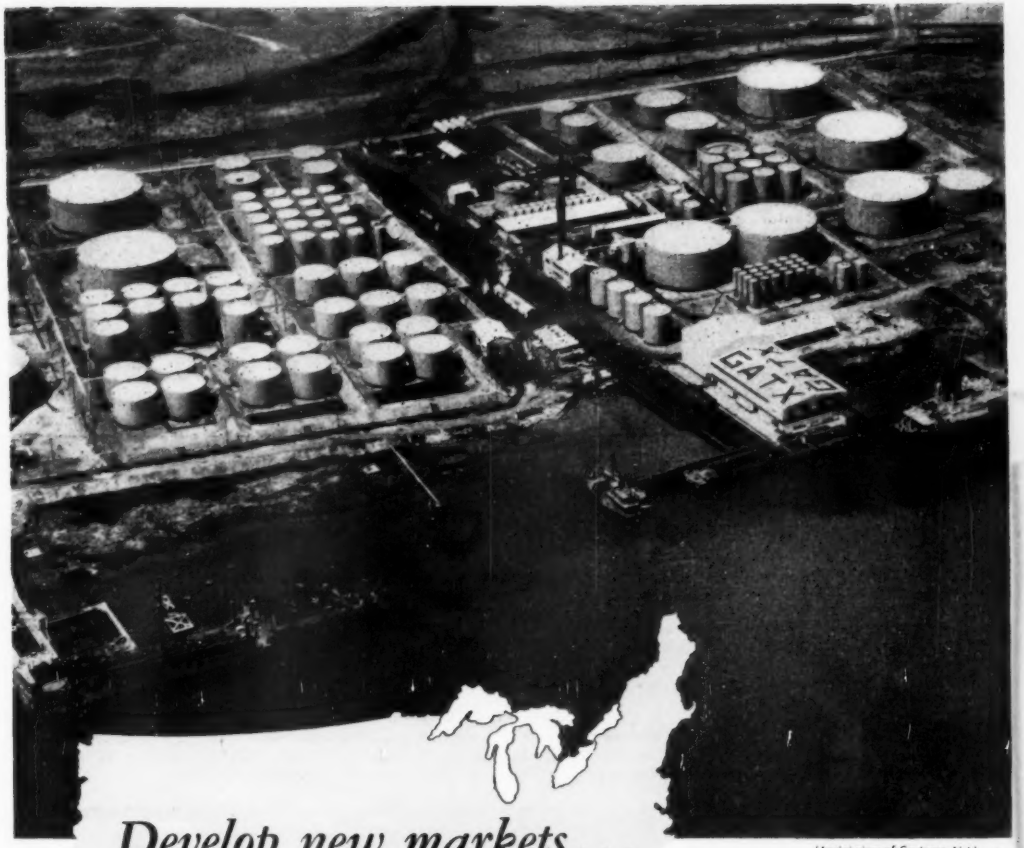
Size, in.	Description—	
7	Casing,	Set at
2¼	Tubing—Drillable retainer production packer	13,551 ft.

Liner

Size, in. o.d.	Description—	Set—From (ft.)	Set—To (ft.)	Sacks cement
5	15 lb. 8-R Thd. N-80 SS with long couplings turned down to 5.375 in. o.d.	13,637	14,187	75

Tubing

Size, in.	Description—	Depth, ft.
2½	6.5 EUE 8-R Thd. N-80 Tubing	5,159
2	4.7 EUE 8-R Thd. N-80 Tubing	13,518
2½	6.5 EUE 8-R Thd. N-80 Tubing	13,551
2⅞ o.d.	Perforated anchor	13,582



(Aerial view of Carteret, N.J.)

Develop new markets . . .

at less cost . . . with no investment in equipment

by using General American Tank Storage Terminals

Make no investment. Risk no capital.

Four strategically located terminals can handle any liquid that flows through a pipeline. They provide tanks, pipelines, docks, loading racks, drumming and canning facilities, labor, supervision and administration.

You may enjoy all the privacy and convenience of your own private terminal. General American warehouse receipts represent the highest form of collateral. For financing, storage and distribution suggestions, contact your nearest General American representative.

GENERAL AMERICAN TANK STORAGE TERMINALS

GENERAL AMERICAN TRANSPORTATION CORPORATION • 135 SOUTH LA SALLE STREET • CHICAGO 90, ILLINOIS

TERMINALS AT: Carteret, N.J.; Houston, Texas; Corpus Christi, Texas; Goodhope, La. • **Offices in Principal Cities**

weight of the casing string was 416,000 lb. Although this weight taxed the capacity of equipment, it was run and cemented without trouble in 22 hours after the start of the job.

Two cement pump trucks were on hand while cementing each of the casing strings so that standby would be available in case of failure. Temperature survey indicated top of cement was at 11,610 ft. representing a fill-up of 90 per cent of table values.

After reaching the total depth of 14,309 ft., three attempts were made without success to test well through drill pipe after setting cement retainers in 7-in. casing and displacing mud with water. In two instances the retainer leaked and in the third it was damaged after setting prematurely.

A production packer was set in 7-in. casing at 10,578 ft. Next day perforated tail pipe and packer-seal assembly were run on $2\frac{7}{8}$-in. drill pipe, connected up and tested at 2,500 lb. without leakage. The tail pipe was picked up and mud displaced with water. The well was open and flowed gas in 2 hours and first oil after rotary mud 4 hours later. The well was turned into the tank the next morning, and produced 837 bbl. of oil through 47/64-in. choke in 24 hours. Later that day, the production packer failed and it was necessary to circulate mud to kill well.

After drilling up production packer, it was found that the hole had bridged in several places below the casing indicating tendency for the formation below the casing shoe to cave and necessity for setting a liner. Accordingly, 5-in. o.d. 15-lb. N-80 casing with couplings turned down to 5.375 in. o.d. was set and cemented from 13,637 to 14,187 ft. After drilling cement plug, the second production packer was set at 13,551 ft. A combination string of 2 and $2\frac{1}{2}$-in. tubing was run in the well and mud displaced with water.

The well was opened into the pits to clean up and then was turned into the tanks, producing 742 bbl. in $19\frac{3}{4}$ hours, then 926 bbl. of 43.8° -gravity oil through 48/64-in. choke in 24 hours.

Acknowledgment

The writer wishes to thank W. M. Saxon, C. M. Harden, and L. J. Fulton of Pure Oil Co. for their assistance in the preparation of this paper.

References

The Oil and Gas Journal, November 4, 1948, page 103, "New Liner-Setting Method Used in World's Deepest Producer," by Leigh S. McCaslin, Jr.

New Rocky Mountain Tank Battery

ONE of the newest large-capacity lease storage batteries in the Rocky Mountain section is that installed by Sinclair Oil & Gas Co. in its Sand Draw field tank-battery consolidation program. The entire battery is placed on a concrete mat and all lines are in concrete-lined conduits, a long life expectancy for the field justifying the permanency and expense of installation.

Storage space in the battery is provided by ten 1,000-bbl. bolted galvanized-steel tanks that are set in two rows of five each. About 7,000 bbl. per day are handled in the battery, production coming from the Tensleep sand.

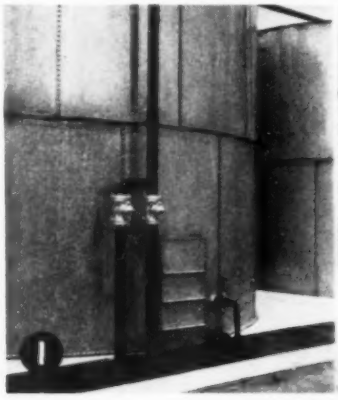
The mat upon which the tanks are set is 8 in. thick. A pipe-line conduit runs down the alley way between the two rows of tanks and on both sides of the battery another conduit is placed which holds the main 4-in. flow header, a 4-in. test header, a 7-in. b.s. line, a 2-in. steam line, and a 2-in. condensate line.

Flow to the battery is through a central manifold where it can be directed either to the main or test header, and from there to any tank in the battery. Individual tank valves for filling or testing are placed in the risers at each tank.

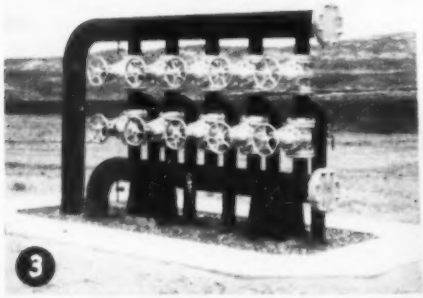
All conduits are covered with $\frac{1}{4}$-in. diamond-tread floor iron which also serves as a walk around the battery. Stairways are built at both ends of the battery for the safety and convenience of pumpers.

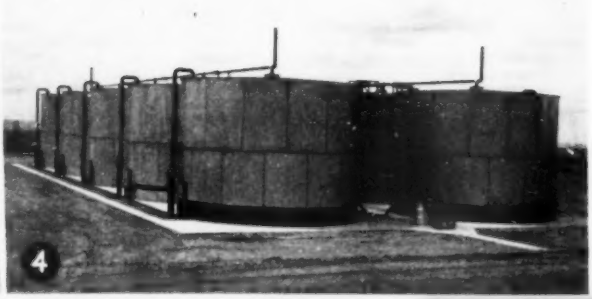
Welded and flanged fittings are used wherever possible for permanence and cleanliness. This plan does away with unions everywhere except at the pipe-line connections, these being furnished by the pipe-line company.

The high cost of installing a battery of this kind is felt to be more than offset by low replacement costs during an expected field life of as long as 40 years. At the same time maintenance costs are reduced considerably, and appearance is much improved.



1—Welded connections avoid leakage. The valves shown here are in risers from the main and test headers. 2—View of the alley way between the two rows of tanks. Conduit for pipe-line connections is shown covered by floor iron. 3—Flow-line manifold from which oil may be directed into main or test headers. 4—A concrete mat furnishes foundation for all the tanks. Concrete walks lead to the stairways at either end of the battery





EASY TO ORDER

Rotary Drilling Packings

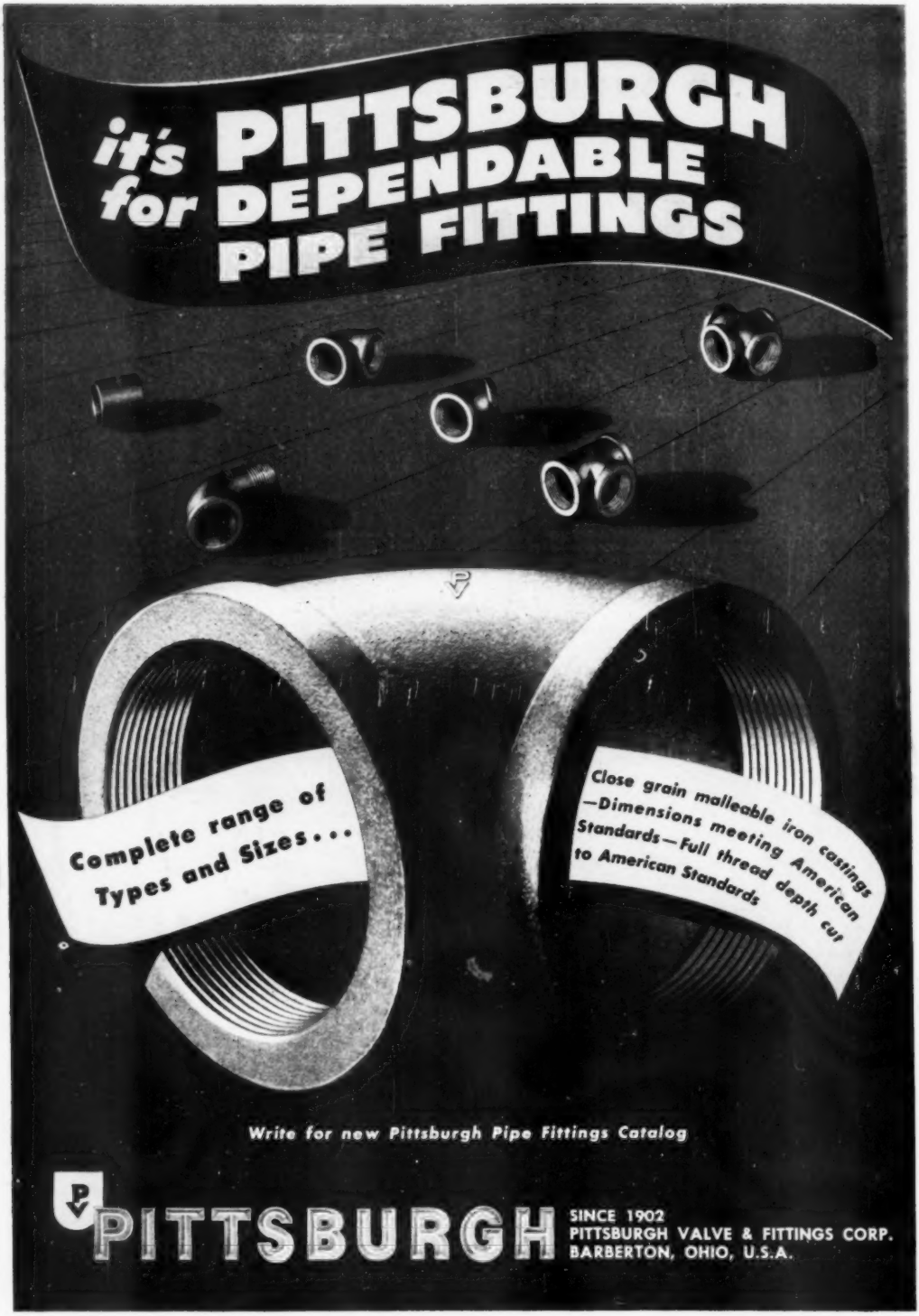
Don't Bother About Shaft Diameters and Stuffing Box Depths . . .

JUST SAY: **I WANT** **FOR** (Name your pump and the size) **THEN** WHEN RE-ORDERING SIMPLY ASK FOR U. S. PACKING—

MADE ONLY BY

U.S. RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY


it's PITTSBURGH for DEPENDABLE PIPE FITTINGS
Complete range of Types and Sizes...
Close grain malleable iron castings —Dimensions meeting American Standards—Full thread depth cut to American Standards
Write for new Pittsburgh Pipe Fittings Catalog
PITTSBURGH
SINCE 1902
PITTSBURGH VALVE & FITTINGS CORP.
BARBERTON, OHIO, U.S.A.

Flow Efficiency

OF A 30-IN. O.D. NATURAL-GAS TRANSMISSION LINE

. . . Based on Operating Data From the California Section of the Texas-Pacific Line

by W. C. Mosteller*

AT the time the California portion of the natural-gas pipe line running from Texas to the Los Angeles area was designed, there was considerable speculation as to the applicable flow equation and as to the flow efficiency of a modern high-pressure natural-gas pipe line. A review of literature available at that time revealed no conclusive data available concerning friction factors or flow efficiencies of lines operating under conditions of this pipe line. Published data were somewhat erratic and, in addition, in a flow range considerably below that of the proposed line. This pipe line has now been in operation for a little more than a year.

The Texas-New Mexico-Arizona section of this pipe line consisting of some 990 miles, primarily of 26-in. o.d. size, with booster stations located at intervals of 80 to 110 miles is owned by El Paso Natural Gas Co. The California portion, owned jointly by Southern California Gas Co. and Southern Counties Gas Co., runs from the Colorado River at Blythe to Santa Fe Springs near Los Angeles and consists of 214 miles of 30-in. o.d. pipe with a booster station at Blythe. The designed capacity of the California extension is 305,000,000 cu. ft. per day.

The California extension is divided into four sections with the pipe-wall thickness of the sections reduced progressively from the initial section at Blythe to the terminal section at Santa Fe Springs. Each section is protected by a pressure-limiting station which prevents pressure buildup over the designed working pressure during low-rate delivery. The pressure-limiting stations are designed so as to afford practically no resistance to flow when the line is operating at full capacity. The maximum working pressure of the initial end of the line at Blythe is 807 psig. and the maximum working pressure of the terminal section is 500 psig. The 214-mile line contains twenty-five 24-in. venturi-type plug valves.

The pipe made up in 30-ft. sections (welded into 60-ft. sections at the mill) was fabricated by the expansion process out of plate which was not pickled. All transverse welds were made without backup rings. Upon fabrication the pipe was immediately shipped to the job site and installed within several months. It is believed that little if any internal corrosion occurred before or during construction due to the arid climate. The line was not cleaned with a go-devil after completion; however, the entire California portion of the line was swept out by a man crawling through the pipe.

Approximately 52,000,000 cu. ft. of gas storage is provided in the California extension. This makes it possible to vary withdrawal rates from the line throughout the day to meet changing load conditions and at the same time to maintain a constant rate of input into the line at Blythe. Fig. 1,

*Southern Counties Gas Co. of California, Los Angeles. Summary of a paper presented at the American Gas Association meeting, French Lick, Ind., May 9-10.

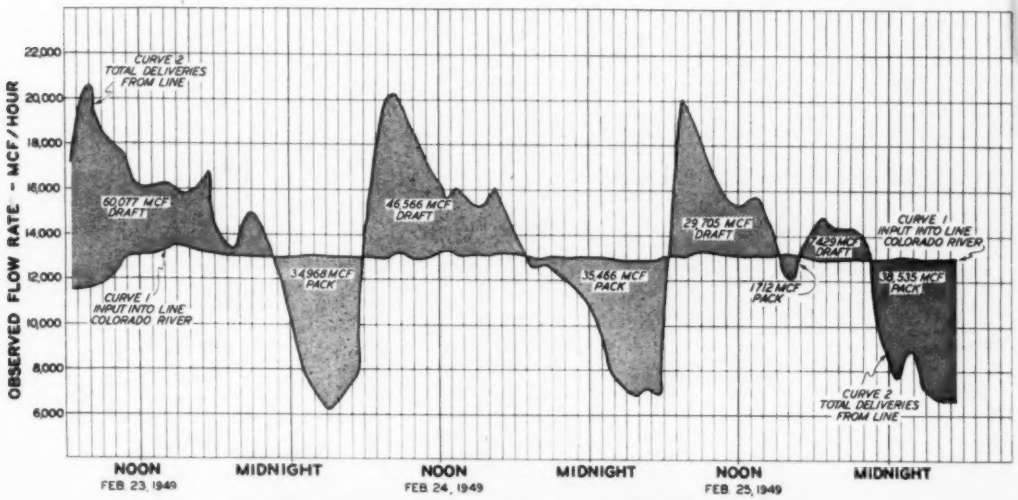


Fig. 1—Gas flow, California section of the Texas-Pacific Coast gas pipe line

showing actual flow data collected from operating logs, illustrates how this line storage works. Curve 1 (Fig. 1) shows the fairly uniform deliveries into the line at Blythe and curve 2 shows the rapidly varying deliveries from the line to the Los Angeles area. The area between curves 1 and 2 shows the amount of storage capacity used on the particular days illustrated. Actual pressure gradients observed in the line are shown in the upper part of Fig. 2 where curve 1 is for the unpacked condition, and curve 2 is for the packed condition.

Method for Calculating Line Efficiency

As a basis of our flow computations the Nikuradse smooth-pipe formula incorporating an efficiency factor to take into account the reduced capacity of a commercial line over a theoretical smooth pipe was selected. It has been our practice to relate all of our efficiency computations on transmission lines to a common basis, namely, a smooth pipe. The efficiency factor takes into account the decrease in capacity due to internal roughness of the pipe and decrease in capacity due to turns, bends, main-line valves, and other similar restrictions to the flow of gas. After reviewing literature and information available on flow efficiency, we selected a value of 85 per cent in designing the California portion of this pipe line. This means that we assumed the pipe line would carry 85 per cent of the flow of a theoretically smooth pipe.

In compiling efficiency data, we have been interested in determining:

1. How the actual line capacity compares with the designed capacity based upon the 85 per cent efficiency assumed in the original designed computations.
2. Whether there will be any change in efficiency with age of the line.
3. Whether there is any variation in efficiency with flow rate (or Reynolds number) through the line.

The results of the efficiency computations made to date are summarized in Table 1. All of the efficiency determinations fall within the range of 83 to 88 per cent. We are satisfied that the line has the capacity for which it was originally designed with a slight margin to spare.

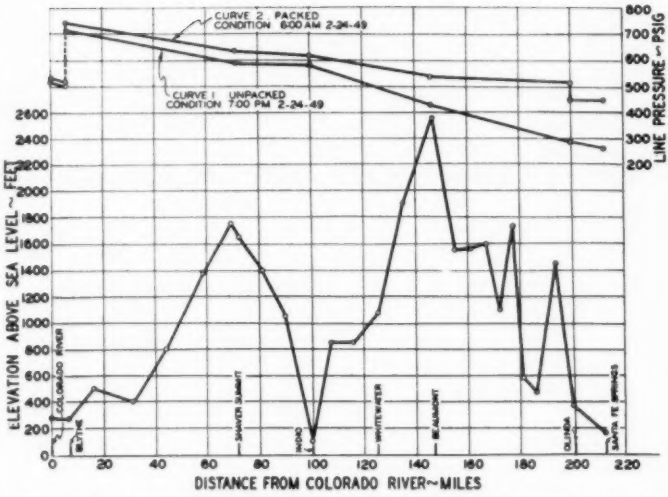


Fig. 2—Profile of ground elevations, California section of Texas-Pacific Coast gas pipe line. At top of chart are observed pressure gradients

It is felt the data collected to date are not sufficient to determine whether there is a change in efficiency with age. Also, we have as yet been unable to resolve whether there is a change in efficiency with flow rate over the range of conditions investigated.

The basic flow formulas employed in computing efficiencies are:

1. Flow equation:

$$Q = 60\ E\ D^{2.5}\ (1/f)^{1/2} \times (520/T)^{1.0} \times \left(\frac{Y\ (P_1^2 - P_2^2)}{L\ G}\right)^{1/2} \qquad (1)$$

where

- Q = flow rate in standard cubic feet per day measured at 14.73 psia. and 60° F.
- E = efficiency factor E = 1.00 for theoretically smooth pipe based upon Nikuradse's friction factor.
- D = pipe internal diameter, in.
- f = Nikuradse's friction factor for theoretically smooth pipe. $\frac{f}{(1/f)^{1/2}}$ is a function of Reynolds number. Values of the quantity are given by the curve, Fig. 3.
- T = temperature of flowing gas, °R.
- Y = deviation from Boyle's law as used in the pressure-volume-temperature equation: $(P_1V_1/T_1)\ Y_1 = (P_2V_2/T_2)\ Y_2$
- P_1 = upstream pressure, psia.
- P_2 = downstream pressure, psia.
- L = length of pipe in miles.
- G = gas specific gravity, air = 1.00.

2. Evaluation of Reynolds number for use in determining the quantity $(1/f)^{1/2}$:

$$\text{Reynolds number} = D\ V\ \rho/12\ \mu$$

where

- D = pipe internal diameter, in.
- V = gas velocity, ft. per sec.
- ρ = gas density, lb. per cu. ft.
- μ = gas absolute viscosity, lb. per sec.-ft.

Reynolds number, for natural gas having a viscosity of 6.8×10^{-6} lb. per sec.-ft. can be expressed in terms of conventional gas quantities as follows:

$$\text{Reynolds number} = 1.989\ Q\ G/D$$

3. Correction involving gas deliveries which may be made at intermediate points.—In our pipe line some gas is delivered to loads at intermediate points along the line. This factor is corrected for by computing an equivalent "end to end" flow rate for use in the equation. The equivalent end to end flow rate is defined as the rate which flowing through the entire length of line has the same effect as a distributed load flowing through a partial section of the line. The equivalent end to end flow rate,

TABLE 1—CALIFORNIA SECTION OF TEXAS-PACIFIC LINE SUMMARY OF EFFICIENCY CHECK

Date—	Duration of equilibrium conditions (hours)	Reynolds number range— Initial end of line near Blythe ($\times 10^6$)	Terminal end of line near Olinda ($\times 10^6$)	Weighted average ($\times 10^6$)	Efficiency
May 19, 1948	10	8.38	5.96	7.97	88.3
November 22, 1948	5	8.95	7.41	8.72	85.5
December 16, 1948	7	11.14	8.10	10.63	86.2
February 6, 1949	6	12.94	10.66	12.46	86.5
February 16, 1949	5	13.76	11.00	13.08	85.7
March 6, 1949	5	13.78	11.83	13.36	83.3
Average					86.0

New Design Feature
CHAPMAN VALVE List 960

Gives more than 50% increase in strength of stem and wedge gate connection...meets the most extreme operating conditions.

Valve stems and gates with the new scientifically designed connection are interchangeable with all List 960 Valves now in service

Here's one more result of the year after year program of research which Chapman carries on to make the List 960 *tops for toughness.* Reason why this small gate valve can lower your maintenance cost — give you more years of useful valve life.

Consistently you will find the Chapman List 960 is *your best valve buy.* It is available in sizes ¼" to 2" . . . rising stem with yoke (as illustrated). Also available rising stem inside screw type. For pressure range 2000 lb. at 100 deg. F., 380 lb. at 1000 deg. F.

For higher pressures specify List 990.

Secret of this 50% increase in strength of the stem and wedge gate connection lies in its new design which compensates at points where excessive stresses can develop.

And don't forget the wear resisting and non-galling properties of the hard heat treated seat rings and the 800 Brinell hardening of the wedge faces by the exclusive Malcomizing Process.

The Chapman Valve Mfg. Co., Indian Orchard, Massachusetts

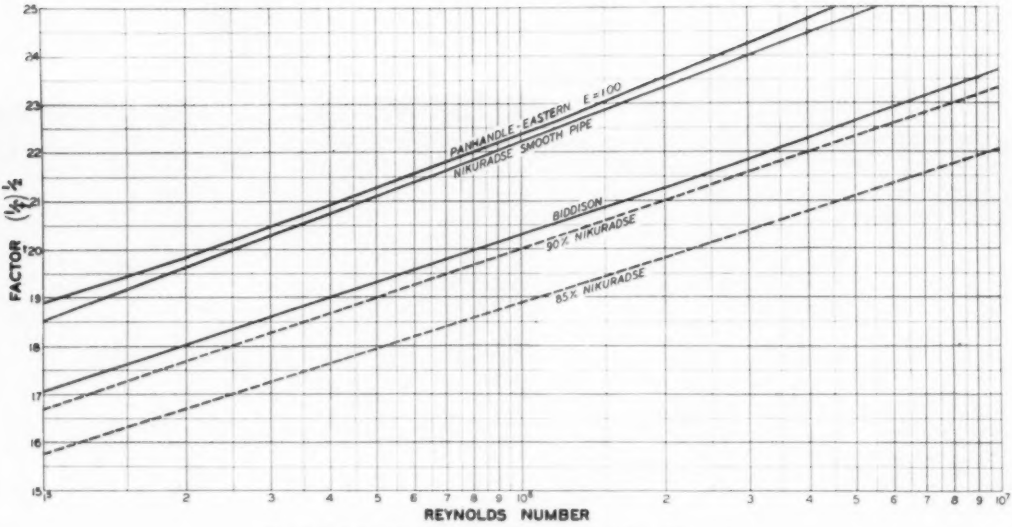
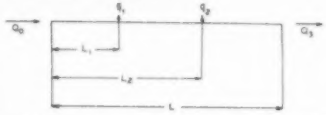


Fig. 3—Relationship between friction factor and Reynolds number

Q_E, is computed as illustrated in the following example:



Where $Q_o = q_1 + q_2 + Q_3$ and $q_1 + q_2$ is relatively small in comparison with Q_3

$$Q_E = Q_3 + q_1 (L_2/L) + q_2 (L_2/L)$$

The above adjustment is an approximation which will not introduce an appreciable error if Q_3 is large in comparison to the distributed load $(q_1 + q_2)$.

4. Correction for differences in elevation along the line.—The elevation along our line varies several thousand feet as illustrated by the elevation profile, Fig. 2. It is therefore necessary to make a correction for elevation in applying the flow equation. This is true even though the initial and terminal ends of our line are at about the same elevation, since under flow conditions, the static heads in the line slopes do not cancel out (as they would in the case of liquid flow) due to variation in gas density along the line. The effect of elevation is very noticeable in sections of the pipe where the elevation is changing rapidly. For instance, in the Shaver Summit-to-Indio section of our line (see Fig. 2) with flow rates as high as 305 million cubic feet per day, the pressure at Indio is often greater than the pressure at Shaver Summit some 28 miles upstream of Indio.

It has been convenient to correct our computations for elevation by a method which takes advantage of pressure data which are available from recording pressure gages located at a number of points along our line. This method takes into account deviation from Boyle's law in determining the elevation correction. It is found that deviation often affects appreciably the elevation correction, and the deviation factor is ignored in those published elevation - correction formulas which have come to our attention. The method we have employed to correct for elevation is illustrated in Table 4.

Corrections have been made in our computations for deviations from Boyle's law and adjustments have been made for differences of elevation along the line and for the fact that some gas is not delivered through the entire pipe line being delivered off to supply loads at intermediate points along the line. A sample computation showing in detail the method used in making these adjustments follows:

Q = 278.2 million cubic feet per day, equivalent flow rate from Table 3.
T = 55° F. or 515° R., observed flow temperature.
$(520/T)^{1/2} = 1.005$.
G = 0.660 measured specific gravity.
L = 204.8 miles effective length of section under study for an internal diameter of 29.31 in.,

TABLE 2—CALIFORNIA SECTION OF TEXAS—LOS ANGELES AREA PIPE LINE
(Date of test—February 6, 1949)

Measured Gas Volumes, M.c.f. Per Hour

		Deliveries out of line									
Avg. for hour ending	Input at Blythe	Indio	El Centro	Beaumont	Riverside	Corona	Carbon Canyon	Puente Street	La Mirada	Volume through Santa Fe Springs	Total	Unaccounted for
3:00 p.m.	12,228	75	47	270	603	322	252	30	525	9,393	11,517	
4:00 p.m.	12,252	72	44	220	613	322	252	21	497	9,156	11,197	
5:00 p.m.	12,264	73	44	256	699	322	260	4	497	8,821	10,976	
6:00 p.m.	12,217	78	43	270	807	320	310	75	582	9,154	11,639	
7:00 p.m.	12,059	81	58	270	814	359	346	132	625	10,284	12,969	
8:00 p.m.	11,902	81	62	293	741	311	339	141	625	10,181	12,774	
Average	12,154	77	50	263	713	326	293	67	558	9,498	11,845	309
Unac. for adjust.	—157	1	1	3	9	4	4	1	7	122	152	
Adjust. avg.	11,997	78	51	266	722	330	297	68	565	9,620	11,997	

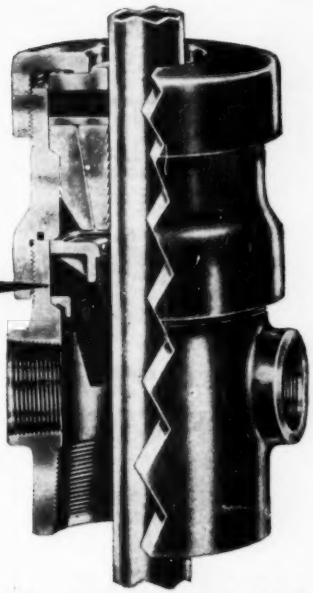
Observed Line Pressures, Psig.

		Shaver Summit pres. limit. sta.			Whitewater pres. limit. sta.			Olinda pres. limit. sta.		
Avg. for hour ending	Compressor outlet Blythe	Inlet	Outlet	Indio	Inlet	Outlet	Beaumont	Inlet	Outlet	Santa Fe Springs
3:00 p.m.	774	670	667	670	625	610	555	505	450	440
4:00 p.m.	771	670	667	670	625	610	560	510	450	439
5:00 p.m.	770	670	667	670	630	615	560	520	450	450
6:00 p.m.	770	670	667	670	630	615	565	525	450	442
7:00 p.m.	769	665	662	670	630	615	565	515	450	435
8:00 p.m.	768	660	657	665	630	615	565	505	450	440
Average	770	668	665	669	628	613	562	513	450	441

IT'S A BLOWOUT PREVENTER • IT'S AN OIL SAVER
IT'S A PRESSURE SEAL . . .

AND PULLING, RUNNING, OR ROTATING-

LARKIN STRIPPERS ARE STRONGER... LAST LONGER



A Stripper Head is no better than its Stripper — and that is the reason why the Larkin Type "SR" Forged Steel Tubing Head is the outstanding buy.

Its molded Neoprene Stripper is designed for flexibility in order to prevent damage while tubing is being pulled, run, or rotated . . . It is oil resistant . . . It is positive . . . It is strong . . . It is economical.

Field tests have proved that the Larkin Stripper lasts twice as long during work-over operations. Recent laboratory tests proved that they will withstand pressures in excess of 4500 pounds p.s.i. without damage. Larkin Tubing Heads are readily available through your supply store.

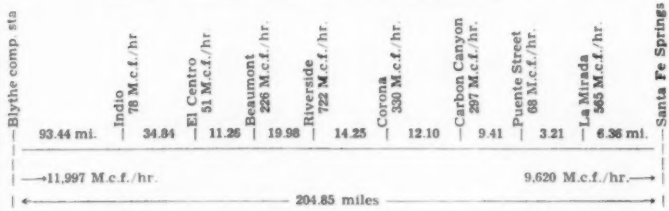
LARKIN PACKER CO., INC.
ST. LOUIS, MO.

LARKIN
...Through Your Supply Store

No. 11 REGULATOR • SELF-OPERATING
CONTROLS FLOW OF GAS, OIL, STEAM, WATER
• EASY TO INSTALL
POWERS
For BETTER TEMPERATURE CONTROL
(P3)
of Crude Oil Treaters, Heaters and Jacket Water for Compressors, Diesel and Gas Engines—use Powers regulators. They're SIMPLE • ECONOMICAL • DEPENDABLE. THE POWERS REGULATOR CO., 2720 Greenview Ave., Chicago 14, Ill. Offices in 50 cities.
WRITE FOR BULLETIN 329P
POWERS

Quick Delivery
ON
INTERNATIONAL TRAC-TRACTORS
and
POWER UNITS
•
LARGE STOCK PARTS
•
Boyd is one of the largest distributors of International industrial machinery west of the Mississippi.
CLARENCE L.
BOYD
CO.
TULSA, OKLAHOMA

TABLE 3—COMPUTATION OF EQUIVALENT FLOW RATE



Indio offtake	78	× 93.44	= 7,288
El Centro offtake	51	× 128.28	= 6,542
Beaumont offtake	266	× 139.54	= 37,118
Riverside offtake	722	× 159.52	= 115,173
Corona offtake	330	× 173.77	= 57,344
Carbon Canyon offtake	297	× 185.87	= 55,203
Puente Street offtake	68	× 195.28	= 13,279
La Mirada offtake	565	× 198.49	= 112,147
			404,094

$$\text{Equivalent off-line load} = \frac{404{,}094}{204.85} = 1{,}973 \text{ M.c.f./hr.}$$

Volume through Santa Fe Springs 9,620 M.c.f./hr.

Equivalent end-to-end load 11,593 M.c.f./hr.

Equivalent daily end-to-end load = 24 × 11,593 = 278,200 M.c.f./day

TABLE 4—SAMPLE COMPUTATION—ELEVATION CORRECTION AND DETERMINATION OF EFFECTIVE $Y(P_1^2 - P_2^2)$

Section—	Blythe to Shaver	Shaver to Indio	Indio to Whitewater	Whitewater to Beaumont	Beaumont to Olinda	Olinda to Santa Fe Springs	Over-all Blythe to Santa Fe Springs
1. Upstream elev., ft.	272	1,650	100	1,070	2,560	375	272
2. Downstream elev., ft.	1,650	100	1,070	2,560	375	160	160
3. Difference, E_s, ft.	+1,378	−1,550	+970	+1,490	−2,185	−215	−112
4. Upstream pres., P_1, psia.	785	679	684	627	575	465	
5. Downstream pres., P_2, psia.	682	684	642	575	528	456	
6. Average line press.,* P_{avg}, psia.	735	681	664	602	552	460	
7. Deviation factor, Y	1.156	1.141	1.141	1.126	1.111	1.096	
8. Elevation head, H, psi.†	28.14	28.94	17.66	24.27	33.20	2.605	
9. $P_1^2 - P_2^2$	151,101	−6,816	55,692	62,504	51,841	8,289	
10. Elevation correction‡	−41,635	+39,416	−23,452	−29,221	+36,653	+2,397	
11. Effective $P_1^2 - P_2^2$ (9 + 10)	109,466	32,600	32,240	33,283	88,494	10,686	
12. Effective $Y(P_1^2 - P_2^2)$ (7 × 11)	126,543	37,197	36,786	37,477	98,317	11,712	348,032

*Under flow conditions $= \frac{2}{3}\left(\frac{P_1^3 - P_2^3}{P_1^2 - P_2^2}\right)$. †$H = \frac{0.0765 \times G \times P_{avg} \times Y \times 520 \times E_s}{144 \times 14.73 \times T}$ $= 0.00002403 P_{avg} \times Y \times E_s$ (for observed flow temperature of 55° F.). ‡Elevation correction $= 2P_{avg} \times H$.

taking into account actual wall thickness of the various sections.

D = 29.31 in., internal diameter.

$D^{2.6} = 4{,}652$.

Reynolds number = $1.989\ Q\ G/D = 12.46 \times 10^6$.

$(1/f)^{1/2} = 22.58$ for smooth pipe. (Nikuradse) from Fig. 3 for a Reynolds number of 12.46×10^6.

$Y(P_1^2 - P_2^2) = 348{,}000$ effective value from Table 4, taking into account correction for elevation and pressure reduction through pressure limiting stations.

When the above values are substituted in Equation 1, the value of E may be determined thus:

$$278{,}200{,}000 = 60E \times 4{,}652 \times 22.58 \times 1.005 \times \left(\frac{348{,}000}{204.8 \times 0.660}\right)^{1/2}$$

E = 0.865 or efficiency = 86.5 per cent.

To our knowledge, there are no other published data available concerning efficiencies of pipe lines operating under range of Reynolds numbers as high as those encountered in the Texas-Pacific line. It is felt that efficiency determinations on other modern high-pressure transmission lines completed within the last several years would also be of considerable interest to the industry and would be of great value to the A.G.A. Subcommittee on Pipe-Line Flow. It would appear that efficiency determinations on many of these lines would be relatively easy to make and that if lines (or sections of lines) were selected that are operating under reasonably steady state conditions accurate results could be obtained

Scurry County, W. Texas

(Continued from page 57)

This would indicate the dry hole was 113 ft. higher on the reef than Humble 1 Perriman, which was completed as a commercial oil well. Electrical logs showed the section to have good porosity. Sample analyses, however, showed porosity in the upper 70 ft. of the reef to be so poorly developed that it is doubtful whether oil is present. Thus some geologists say that there is only a 50-50 chance the well was commercial.

Diamond-M field at the southern end of the trend is the next most promising area. There some 300 ft. of reef oil pay has been cut by several of the 10 wells completed to date. Highest well in this field topped the reef at —4,187 ft., and the lowest to date encountered it at about —4,400 ft. Although no wells have been carried to water in this area, the water level is thought to be at about 4,430 ft. subsea. Bottom-hole pressures are approximately 3,080 psi. at 4,270 ft. subsea.

As in the North Snyder area, it is possible that continued drilling in the area between the Diamond-M and North Sharon Ridge (Canyon) fields will result in their being linked. A saddle is indicated between the two areas but sufficient relief may be present to permit their uniting. The well farthest south in Diamond-M, Hiawatha 2 Wilson in SW Section 183, topped the reef at —4,398 ft. and drilled to a total depth of 6,801 ft. (4,414 ft. subsea). While the well is still in the process of being completed it is expected to make a better producer than the north offset.

Should the two areas be linked it is estimated the field will approximate 5 sections in size, or about 3,000 acres. Because of the smaller producing section, oil recoveries per acre are expected to be much less than in North Snyder. Lion Oil Co. is the largest acreage owner in this area, followed by Humble and Cities Service. Of the 12 rigs at work there, 7 are drilling on Lion properties.

The Kelly and Schattel areas to the east are believed to contain less reef section above the oil-water contact than at Diamond-M. This is shown by the cross-section across the area.

Drilling in the Kelly area is too scattered to depict fully the amount of relief that may be present. Based on present knowledge, however, there appears to be a relatively flat reef mass extending only slightly above the oil-water contact. As is shown in the accompanying map, Magnolia Petroleum Co. has completed three producers and is in the process of completing a fourth, its 2 Winston. All cut only a few feet of porous reef section because of their proximity to water.

Schattel field, where first Canyon reef oil production for the area was established, has proved very disappointing. Drilled by Sun Oil Co. 1 Schattel topped the reef at—4,424 ft. and after cutting a few feet of cap rock drilled some 75 ft. of porous pay. It was completed for a flowing potential of 480 bbl. daily.

East and west offsets to the 1 Schattel found water in the reef, as did the test to the northwest, indicating the first well had encountered reef pinnacle or a "pimple." Thus the development that opened the play in Scurry County has been the most disappointing. It does, however, offer an excellent example of what can happen in reef exploitation—that no location of oil production is assured until after the well is drilled.

The two most recent wildcat efforts in the area also have missed the reef. Four miles north of Diamond-M field (NW Section 256) C. L. Norsworthy, Jr. 1 Williamson was a failure in the reef and was abandoned after drilling into the Strawn. One mile east of the Kelly area, in Section 38, Kirkland and Fields Survey, W. A. Moncrief et al 1 Moore also found water in the Canyon. The test was then carried to the Ellenburger and on a drill-stem test at 7,928-45 ft. only drilling mud was recovered. At last reports an electrical log was being run preparatory to plugging.

THOMAS
ALL METAL
Flexible COUPLINGS
SPECIFIED WHEREVER 100% DEPENDABILITY IS DEMANDED
Refiners specify Thomas "Flexible" Couplings for PUMPS, COMPRESSORS, COAL PULVERIZERS, COOLING TOWERS and GENERATOR SETS.
TYPE DBZ-C
Pipe Line Men know that Thomas "Flexible" Couplings on their Low or High Speed Pumps give 100% dependable service.
TYPE CM
Drilling Engineers get the most out of their equipment with Thomas "Flexible" Couplings on Engine, Gear and Mud Pump Drives.
TYPE DBZ-B
In the Laboratory Thomas "Flexible" Dynamometer Couplings assure the greatest accuracy.
Thomas Flexible All-Metal Couplings Have No Wearing Parts.
BACKLASH, FRICTION and CROSS-PULL ARE ELIMINATED.
NO LUBRICATION IS REQUIRED!
Write for the new Engineering Catalog
TYPE DBZ
THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Truco DIAMOND CORE HEAD

THE Jewel OF THE OIL FIELD!

All features so necessary to insure full core recovery are incorporated in D & S core barrels.

Core barrels, core heads, reamers and washover or rotary shoes to suit every hole or casing program.

Drilling & Service, Inc.

3031 Elm Street Dallas 1, Texas

Other Offices — Stocks — Service

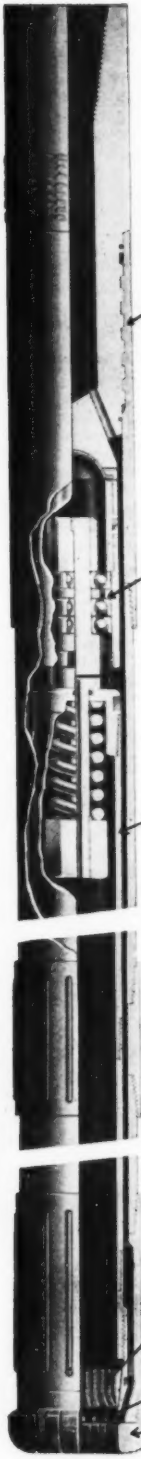
	Shreveport	Odessa	*Lindsay	Casper
Phone:	78627	6774	279	3739

*Car mobile phone through Oklahoma City, Ardmore, Lawton ZF44645

Distributors for

WHEEL TRUEING TOOL CO.

DETROIT, MICHIGAN



Safety Joint (optional). Should core barrel become stuck, removes inner barrel and core.

Fully enclosed grease packed bearings with diaphragm to equalize hydrostatic pressure differentials, insuring long bearing life and non-rotating inner tubes.

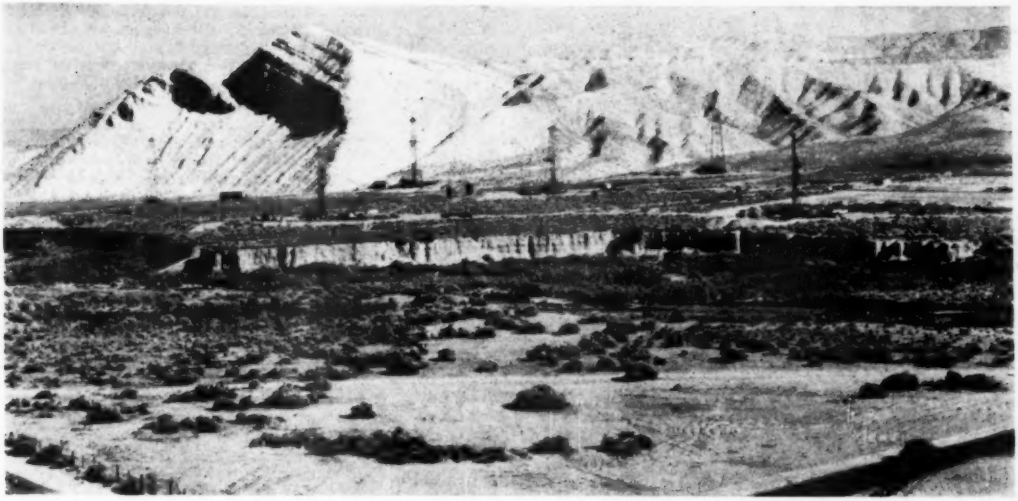
Flush joint alloy steel inner tubes with uniform smooth bore minimizing core friction.

Heavy wall alloy steel tubing used throughout. Sectional with a minimum of joints in lengths up to 90 feet.

Core catcher enclosed inside inner tube eliminates core scrambling and subsequent core blocking.

Minimum of core exposure to circulating fluid.

Truco diamond core head.



White Rock area of Cuyama Valley a few months after Anderson-Colgrove 37-30 came in

Cuyama Valley

(Continued from page 59)

The well flowed at the rate of 1,320 bbl. a day. The oil showed 37.8°-gravity. This new zone was named the Colgrove sand.

Now, with the area entering its second productive year, Richfield has completed 82 producing wells in Russell Ranch field. Seventy-four wells are in the Dibblee zone and eight are in the Colgrove zone. Seventy-nine of the wells are flowing and three marginal wells are on the pump. Hancock has five producing wells in this field and Southern California Petroleum has one gas well.

Initial production of Dibblee zone wells has varied from 250 to 6,000 bbl. a day, with gravities of 32° to 38°. The Colgrove zone production has ranged from 1,150 to 1,400 bbl. per day with gravities from 37° to 39.5°.

Richfield Biggest Producer

Many of the initial-flow measurements were made over a short period of time and through a large bean. Present conservation practice restricts average Russell Ranch production to about 250 bbl. per day per well. Richfield, the biggest producer in this field, is currently taking around 16,000 bbl. of oil a day.

One rather surprising well in the northern sector of the valley is 2 Joice, put down by the Southern California Petroleum Corp. This well is in the White Rock area of Russell Ranch field. The well was carried to a depth of 3,891 ft. Tests on the lower formations failed but the well produced 3 to 5 million cubic feet of wet gas from 2,800 ft. Although this gas formation is high it is considered part of the Dibblee zone. This well is now being shut in until a market for the gas is found.

In the meantime Richfield, in conjunction with Southern California Petroleum, is ready to start an offset to this gas producer. The offset site is to the west, on the Schlaudeman lease.

Since the first Russell Ranch well, exploration and drilling have been very active in Cuyama Valley. In fact the interest is general in all the lands west of the San Andreas fault. Active areas now extend 10 miles north of Russell Ranch where a wildcat is being put down at Carrizo Plains. This area bears a close resemblance to Cuyama and the well is attracting considerable attention.

Rollin Eckis (left) chief geologist and Frank A. Morgan, vice president and manager of exploration for Richfield Oil Co., check cores at a Cuyama drilling site

This well, 67 Temblor-Rexroth, is a joint venture of Gene Reid Drilling Co., Independent Exploration Co., and Universal Exploration Co. At last report the well was down 2,129 ft.

Second Field Discovered

The southern end of the valley has already seen a second field discovered. This is South Cuyama field discovered in May of this year, about 5 miles below Russell Ranch field. Production here is also from the Dibblee sand. The formation was topped at 4,110 ft. and the well placed in production at 4,392 ft. Initial production showed 5,080 bbl. per day of 34.2°-gravity oil, but the flow is now restricted to conform with good production practice. Settled rates for well in this field are expected to be around 350 bbl. a day.

The South Cuyama discovery well was put down by Richfield. Shortly after the discovery, Superior brought in an offset producer 1,000 ft. northeast of the discovery well. Richfield now has three producing wells in this field and Superior two. This field is not yet fully outlined and its potentialities have not been determined. Richfield is now trying to gage the field with its 1 Perkins. This well is planned as a deep test of all possible producing formations and will probably go down to basement rock. Progress on this well is naturally slow as there has been considerable coring and testing. The well is being drilled tight. Last reports showed the well down 11,883 ft.

At the present time Superior has two development wells drilling in South Cuyama. Richfield has three more drilling and two in the process of site preparation. Other companies holding land rights in this area have not yet started tests.

Raydist

(Continued from page 71)

your base. Set the counter on the red phase meter so that it registers the same number as the line on the map. Turn on the phase meter. If the boat is exactly on the line, the meter registers zero. If the boat isn't exactly on the line, the meter will show how much out of phase the two radio waves are. Now as the boat moves out and around, the pointer on the phase meter will revolve one full turn every time the boat moves from one red line to the next. The pointer will turn either clockwise or counterclockwise, so if you go in one direction, every full turn of the pointer will add one number on your counter; if you go in the other direction, each complete turn of the pointer will subtract one number.

So far you have a system that will always tell you what number red line you are on, or how far to the right or left you are of any given red line. You still need more information to locate your position.

Take the known position of your yellow and green land stations now and go through the same process. This will give you a series of green lines on your base map, and these green lines will cross the red lines you previously plotted. Number these green lines on the map. Fix up a counter on your green phase meter with these same numbers. When you get ready to leave port, set the counter on your green phase meter and now you can always tell what green line you are on.

But these red and green lines on the map intersect each other. So, you read the red meter and find the corresponding red line on your map. Read the green meter, find the corresponding green line on your map. Trace the red and green lines until they cross each other on the map. The intersection is your position and that surveying job is finished.

All phase-comparison radio surveying systems have the advantage that there can be no cumulative error in making measurements. They are automatically correct every time you reach a point where two waves are exactly in phase. The actual measurements are made by the phase meter. In theory, at least, the only chance for error is the measurement of the difference of phase between two waves of known length. The pointer on the dial registers the difference in phase of two waves, and that is some part of a half wave length. However, as you move farther out from the land stations, the space between the red and green lines on the map becomes greater, and the accuracy less.

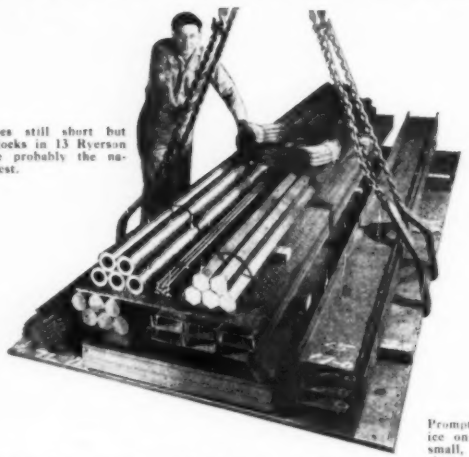
Close in to the land stations, say 2 miles, the accuracy should be plus or minus 25 ft. when the land stations are separated by 25 miles. At 40 miles out, the accuracy will probably be plus or minus 50 ft.

The special features of Raydist are in the arrangement of continuous wave transmitters which produce the all important "squeals." (See Fig. 1.) In the Raydist system, you have the key, or vital transmitter on your boat. This transmitter sends out a steady signal on a 2.0068-megacycle frequency (a wave length of about 500 ft.). On land, located conveniently with regard to the red, yellow, and green land stations there is a reference transmitting station. This reference transmitter also sends out a steady signal, but on a 2.0072-megacycle frequency, instead of the 2.0068 signal from your boat.

At red, yellow, and green land stations you put in radio receivers tuned to 2.0070 megacycles. This is exactly half way between the 2.0068 wave from your boat and the 2.0072 wave from the land reference transmitter. Each 2.0070 receiver picks up the beat note (heterodyne wave) that results from mixing up the 2.0068 wave from your boat and the 2.0072 wave from the reference transmitter.

At red, yellow, and green stations, these three heterodyne waves are modulated on carrier radio waves and rebroadcast to your boat receivers. Red uses a 29.720-megacycle carrier wave; yellow a 29.760-megacycle carrier, and green a 29.800-megacycle carrier. On the boat, each receiver picks up its particular wave. The

Steel for Oil & Gas Industry



Some types still short but over-all stocks in 13 Ryerson plants are probably the nation's largest.

Prompt personal steel service on all orders, large or small, is a Ryerson tradition.

Call us when you need these products

BARS—carbon & alloy, hot rolled & cold finished
STRUCTURALS—channels, angles, I & H beams, etc.
PLATES—sheared & U. M., Inland 4-Way Floor Plate
SHEETS—hot & cold rolled, many types & coatings
TUBING—seamless & welded, mechanical & boiler tubes
STAINLESS—Allegheny metal sheets, plates, bars, tubes, pipe, etc.
ALLOY STEEL—many types—as rolled, annealed, heat treated
REINFORCING—bars & accessories, wire mesh, etc.
BABBITT—and phenolic laminated bearing material
MACHINERY & TOOLS—metal working & boiler shop

Joseph T. Ryerson & Son, Inc. Steel-Service Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco.

Accurate cutting to your order is assured by modern Ryerson equipment.

You get quick delivery anywhere, because the network of Ryerson plants stretches from coast to coast.

RYERSON

heterodyne wave, or beat note is stripped off each carrier wave, and passed into its proper meter.

If this modulation and carrier wave combination confuses you, just assume that the beat note at each land station is loaded on a lightning-fast plane, sent back to your boat, and automatically dropped into the proper phase meter.

Now you have a system in which the only distance that ever varies is the distance to the boat. All the other points are fixed on land. All the waves the red land station receives from the reference transmitter travel the same distance in the same length of time. From reference to yellow land receiver, all waves travel a constant distance, in a constant time. From reference to green land receiver the distance is always the same and so is the time. But red, yellow, and green land receivers are also getting radio waves from the boat. These waves vary, according to the boat's movements.

To sum it all up: Raydist measures distance by using radio waves. Instead of trying to split seconds up into millions of parts, you compute in advance just where radio waves from two fixed stations will be in phase, and mark those lines on a map. By using three stations you get two sets of lines on the map, and these lines cross each other in a latticework. You number these two sets of lines. When your boat leaves port, you set the counters on two phase meters to check with the two numbered lines on the map at that port location. Then as your boat moves around, each phase meter adds or subtracts one number on the counter every time you reach the next line. You read the two meters, find the corresponding numbered lines on the map, and the boat is where those two lines cross each other.

You really don't have to understand it to locate your boat position. All you have to do is read numbers on dials, (Fig. 4) find lines on the map with the same numbers, follow the lines until they intersect, and make a mark on the map.

Mississippi Geologists Plan 4-Day Field Trip in August

HOUSTON. — Robert O. Sprague, president, has announced that the Mississippi Geological Society's seventh annual trip will start from the Thomas Jefferson Hotel in Birmingham August 23.

The 4-day field trip will include the study of the pre-Cambrian and Paleozoic rocks of northern Alabama and South-Central Tennessee, the crystalline and metamorphic rocks of eastern Alabama, the Birmingham district and Black Warrior Basin in the Tennessee Valley, and the Silurian and Devonian areas of South-Central Tennessee.

Diesel "KNOW-HOW" Rolls Freight Faster

on the Santa Fe

Diesel power in main-line freight service got its start on the Santa Fe.

Ever since that first big 5400-hp Diesel locomotive rolled a hundred heavy refrigerator cars in a record run between California and Chicago, Santa Fe has been the leading exponent of freight Diesel operation. It means smoother handling, easier starts and stops, better "on-time" performance.

Santa Fe is constantly adding to its backlog of Diesel "know-how" with expansion of its Diesel fleet and its maintenance and service facilities.

For more information on how we can serve you, see your Santa Fe freight representative.

Santa Fe all the way

F. H. ROCKWELL, General Freight Traffic Manager
Chicago 4, Illinois

Santa Fe

McCullough TOOL COMPANY

5820 S. Alameda St.
Los Angeles 11
California

405 McCarty Ave.
(P.O. Box 2575)
Houston, Texas

28
SERVICE LOCATIONS

TEXAS:
HOUSTON
ALICE
CISCO
CORPUS CHRISTI
McALLEN
ODESSA
TYLER
SAN ANGELO
VICTORIA
WICHITA FALLS

OKLAHOMA:
OKLAHOMA CITY
GUYMON
HEALDTON

MISSISSIPPI:
LAUREL

NEW MEXICO:
HOBBS

CALIFORNIA:
LOS ANGELES
AVENAL
BAKERSFIELD
VENTURA

LOUISIANA:
HOUMA
LAKE CHARLES
NEW IBERIA
SHREVEPORT

KANSAS:
GREAT BEND

WYOMING:
CASPER
CODY

MONTANA:
CUT BANK

CANADA:
EDMONTON

EXPORT OFFICE:
30 Rockefeller Plaza
NEW YORK 20, N.Y.

24 Hours a Day...

McCullough

goes **ANYWHERE** to do your

FISHING JOBS

with the

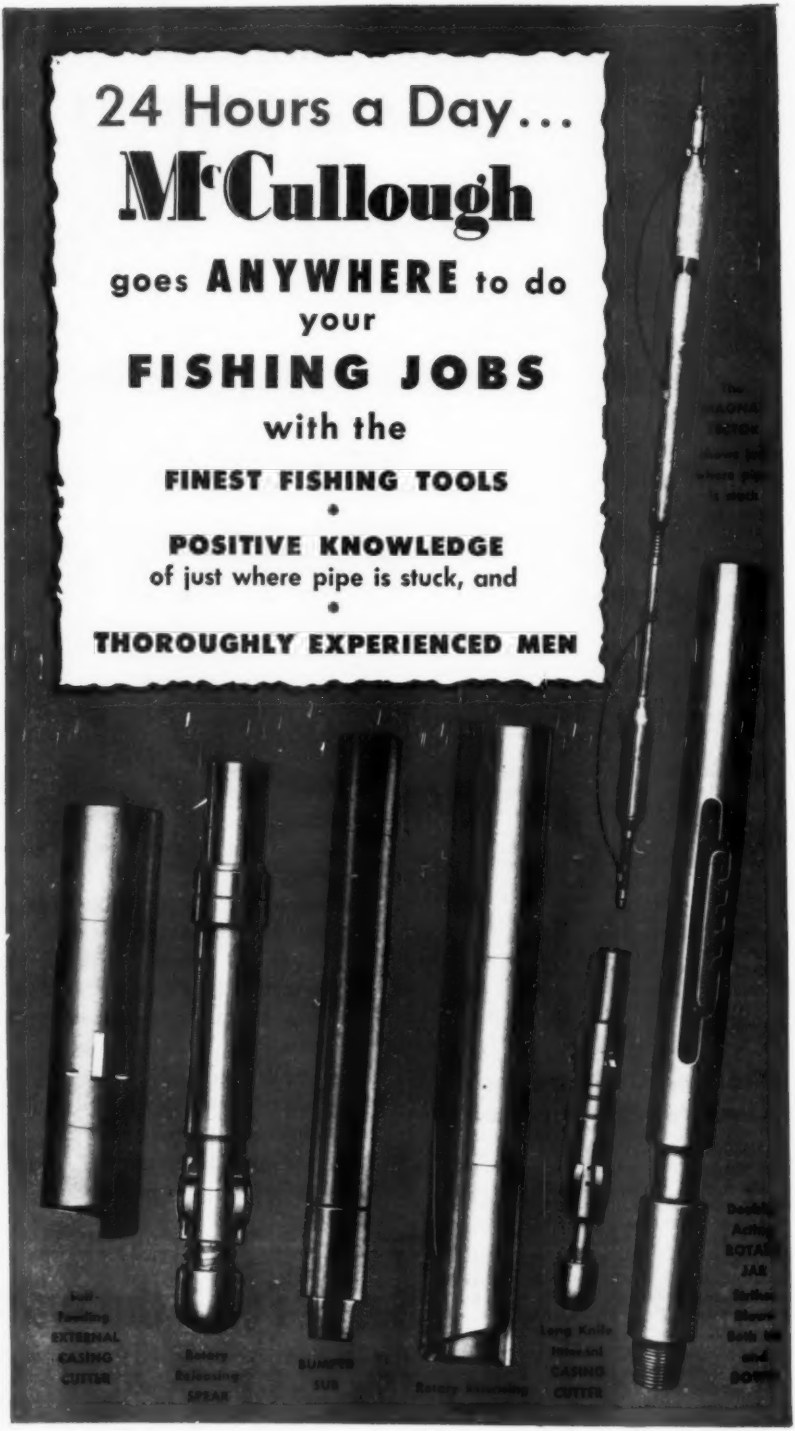
FINEST FISHING TOOLS

•

POSITIVE KNOWLEDGE
of just where pipe is stuck, and

•

THOROUGHLY EXPERIENCED MEN



ENGINEERING fundamentals

Rate of Capillary Displacement

IN considering the displacement of oil by water from porous materials, there is a frequent tendency to confuse the magnitude of the displacing forces with the speed of displacement. The following discussion is a brief analysis of the differentiation between these two aspects of capillary displacement.

The importance of displacement velocity as applied to a horizontal capillary system was first brought to the writer's attention by Yuster[1]. The following is an adaptation of his argument. Consider a straight-bore capillary from which oil, let us say, is being displaced by the imbibition of water. The force of displacement is the capillary, or displacement, pressure, which is

$$P_D = \frac{2\gamma \cos\Theta}{R} \qquad (1)$$

a quantity inversely proportional to the radius. According to Poiseuille's law, on the other hand, the average velocity of fluid movement in a capillary is proportional to the radius squared and to the pressure gradient. (Although the expression for velocity at any position of displacement is not given by the simple Poiseuille equation, the velocity nevertheless still varies as the square of the radius.) Taking the displacement pressure of equation (1) as the driving gradient, therefore, produces the net result that the imbibition velocity is proportional to the radius of the capillary. Thus, considering the situation of two horizontally placed capillaries of radii R_1 and R_2 as shown in Fig. 1(a), the relative speeds of imbibition would be such that the displacement would be completed first in the larger capillary as shown in Fig. 1(b) although the magnitude of the displacing force would be larger in the smaller capillary.

Similarly, in a porous system, the velocity of movement is proportional to the permeability, k, as given by Darcy's law.

$$v = \frac{k\ dP}{\mu\ dl} \qquad (2)$$

In a porous system, also, the capillary pressure, which is a measure of the driving potential under which imbibition proceeds, is proportional to the square root of the permeability. As given by Leverett,[2] it is

$$P_c = \gamma \sqrt{\Phi/k}\ J(S_w) \qquad (3)$$

Thus, when combining the capillary potential with Darcy's law, the result found would be a velocity of imbibition proportional to the square root of the permeability. In other words, the more permeable a section the more rapidly oil could be displaced by the imbibition of water, although the capillary forces were smaller in magnitude in the less permeable section.

The rate at which a liquid will rise by capillary imbibition within a vertical porous system has been investigated experimentally as well as analytically. Results of such experiments made on columns of soil[3] showed that for soils with finer particle sizes the velocity of water rise was less than for soils with larger particle sizes. The permeability in instances of this type would increase with particle size. Thus, one must consider that even in a vertical porous system the rate of oil displacement by water imbibition increases with the permeability. Fig. 2 is a curve duplicated from the above reference to show the variation in moisture rise with particle size. The sand and silt in question were of narrow range in particle size and the sand was of a larger particle size than was the silt, thus permeability decreases to the right of the diagram.

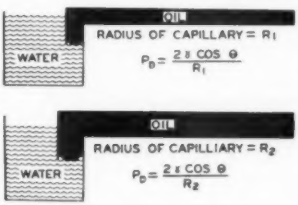


Fig. 1(a)

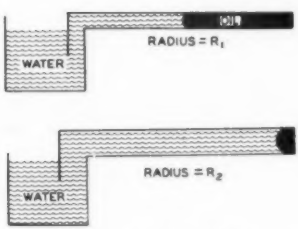


Fig. 1(b)—Displacement completed first in larger capillary

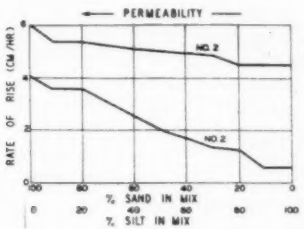


Fig. 2—Rate of moisture imbibition. Silt in No. 2 is finer grained than in No. 1. sand same in both cases

References

1. Yuster, S. T., The Pennsylvania State College, Personal Communication.

2. Leverett, M. C., The Capillary Behavior in Porous Solids, A.I.M.E. Transactions 1941, vol. 142.

3. Dallavalle, Micromeritics, page 240 and following, Pitman Publishing Co.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

A Billion Barrels of Adsorbent Experience...

at your service

TO dabble for a moment in big numbers, about one billion barrels of petroleum products have been finish-treated by the three and one-half billion pounds of adsorbents which Attapulgus and Porocel have shipped to oil refineries. Attapulgus Fullers Earths and Porocel Activated Bauxites have become recognized standards in the removal or reduction of odors, colors, tastes, moisture, acids, sulfur, fluorides and unsaturates, and for solid catalyst purposes. And in this wide range of services, finished value was gained in a long list of petroleum cuts—from the lightest distillates to the heaviest lubes and waxes.

This all adds up to a lot of adsorbent experience—experience with the many treatments which precede the application of these two basic materials to specific adsorbent jobs; and experience measured by our extensive research and product evaluation—from laboratory and pilot plant on through to commercial scale phases—both on our own and in co-operation with our customers.

So there's great merit to the suggestion that it pays to consult Attapulgus and Porocel. In your own plans to improve products or expand output, perhaps our one billion barrels of adsorbent experience can be of real help to you in selecting the right adsorbent and the right conditions. Our laboratory and process staff are at your service, without obligation.

ATTAPULGUS CLAY COMPANY *Fullers Earth* • **POROCEL CORPORATION** *Activated Bauxites*

Dept. V, 210 West Washington Square, Philadelphia 5, Pa.

Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Refrigeration Plants

APPROXIMATE COST INDEXES (1946 = 100)

Year	Refrigeration equip.*	Refinery labor†
1924	76.5	60
1926	79.5	58
1928	77	57
1929	73	59
1930	69	57
1931	59.5	57
1932	55.5	48
1933	57	49
1934	60	55
1935	63	58
1936	66	60
1937	69.5	65
1938	66	67
1939	65	68
1940	66	69
1941	71	71
1942	76	79
1943	77	87
1944	79.5	90
1945	81	94
1946	100	100
1947	129	119
1948	141	154 est.
1949 Jan.	144	150 est.

*Marshall-Stevens Index, Chem. Engineering, February 1949, p. 129. †Cost-imating No. 1, Construction Cost Indexes, The Oil and Gas Journal, October 21, 1948, p. 141.

A TON of refrigeration is the heat derived when 1 ton of ice is melted from and at 32° F. This amounts to:

288,000 B.t.u. per day
or, 12,000 B.t.u. per hour
or, 200 B.t.u. per minute

Thus, if water at 90° F. is to be frozen into ice at 24° F., the heat removed per ton will be:

2,000 × (90 — 32) × 1.0 = 116,000 B.t.u.
2,000 × 144 (fusion) = 288,000 B.t.u.
2,000 × (32 — 24) × 0.5 = 8,000 B.t.u.
412,000 B.t.u.

If the ton is to be frozen in 1 hour, the tons of refrigeration required are:

$$\frac{412{,}000}{12{,}000} = 34.4 \text{ tons}$$

The refrigeration requirements of refinery-process installations can be directly computed from the process design, and likewise the heat losses through walls, insulation, etc., can be computed, but other miscellaneous agencies which dissipate cold are approximately:

	Tons refrigeration
Persons	0.02-0.04
Kw. of lighting	0.3-0.5
Hp. of motor	0.15-0.25
1,000 ft.² outside air	2.0-3.0
1,000 sq. ft. walls, floor and ceiling	0.3-0.5
1,000 sq. ft., glass area	1.3-1.5

Tables 1 and 2 taken largely from the author's files, but also from an article in Chemical Engineering, "Refrigeration Costs," May 1947, pages 125 and 138, summarizes the costs of refrigeration equipment. Table 1 shows the costs of refrigeration equipment complete for the refrigeration equipment proper. It is thus directly applicable to most refinery applications. It does not include the costs of the auxiliary equipment for the transfer of the cooling to other materials such as lubricating oil or absorption oil. It also does not include the costs of connecting or drain lines for water, steam, condensate, drains, compressed air or brine, nor the electrical service lines. Note that the cost rises sharply at about —30° F., because two-stage compression becomes necessary at about this temperature, and because Freon 22 (monofluoro dichloro methane) is better than ammonia for very low temperatures.

TABLE 1—APPROXIMATE COSTS (1946) OF REFRIGERATION SYSTEMS.* $ PER TON REFRIGERATION, COMPLETE EXCEPT FOR AUXILIARIES†

Evaporator temp., °F.	2-10 tons	10-50 tons	50-250 tons	250-1,250 tons	1,250-6,250 tons
40	$350	$280	$210	$160	$100
20	480	420	330	270	200
0	710	580	370	290	240
—20	830	700	480	360	340
—40	1,380	880	700	480	470
—60	2,200	1,330	1,060	615	610
—80	3,100	2,160	1,500	780	780

*Table 1 is based on cooling with city water in tubular condensers. If a cooling tower is used, add $52-$60 per ton refrigeration. If water-sprayed (evaporative) condensers are used, add $35-$42 per ton refrigeration. If well water (55° F.) is available, the cost of the well and its pump must be added. †Refrigeration units complete but no equipment for delivering the cold to other equipments, no service piping for water, drains, steam, condensate, air or brine, no electrical feed lines and no building alterations.

TABLE 2—APPROXIMATE* COSTS (1946) OF COMPLETE REFRIGERATION PLANTS INCLUDING ALL AUXILIARIES.* $ PER TON REFRIGERATION

Evaporator temp., °F.	2-10 tons	10-50 tons	50-250 tons	250-1,250 tons	1,250-6,250 tons
50	$485	$416	$416	$416	$348
40	555	485	416	416	348
30	695	590	485	416	348
5	870	695	555	416	348
—20	1,400	1,040	830	695	555
—45	2,600	1,300	1,040	1,040	1,040
—70	6,950	1,740	1,740	1,390	1,390
—90	13,900	3,500	3,500	1,740	1,740

*Since there are so many applications such as ice manufacture, cold-storage rooms, water cooling, air conditioning, etc., the values given are gross approximations.

No. 38 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

A flange broken 50 years ago...

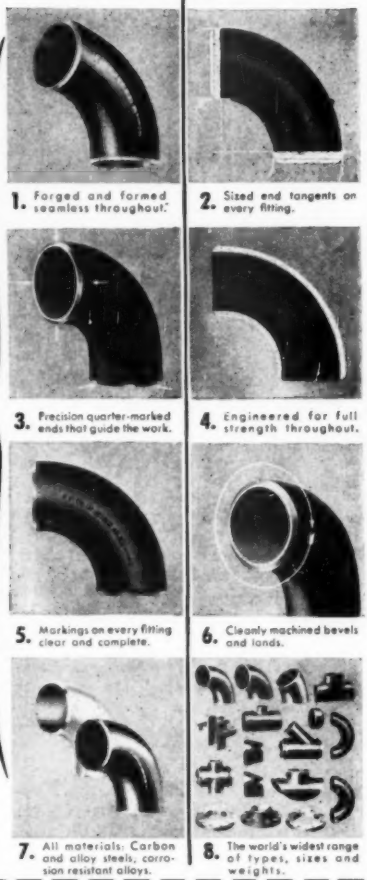
...led to one thing, to another, to another...

When Taylor Forge started up, way back, with spiral pipe it was our No. 1 item (still important). In those days cast iron flanges were largely used, and the troubles resulting from flange breakage were frequent and aggravating. The remedy for this major headache was found in the development of forged steel flanges; first for our own spiral pipe, later for our straight seam, and in fact any pipe; finally for general pressure vessel and industrial application.

That put us definitely in the forging business some forty years ago and was the start of a long pioneering journey into the field of engineered piping problems. The expanding needs of industry multiplied the response for larger, heavier, stronger, and tougher flange and ring forgings to which we reacted with new, heavier, and numerous units of forge, press, and rolling equipment. It was equally necessary to pioneer design methods, not only for flanges and pipe application, but for other pressure vessel components as well—so that almost automatically we became, and remain, the world's largest manufacturer of forged (or forge-rolled) steel flanges, welding necks, manways and nozzles, etc., for *any* application.

Then came rapid strides in the art of welding which quickly cancelled out the crude, cut-fit-patch methods first attempted in pipe systems. Again we found it necessary to *engineer* the design of suitable components. Several years of research preceded the development of the *full*, engineered line of Taylor Forge welding fittings—the well-known WeldELL line. Examine the illustrations to the right, and note how many unique features combine good engineering with good sense and ultimate economy. The coupon below is the convenient means for getting more information about the fittings that have "Everything."

WeldELLS have everything



1. Forged and formed seamless throughout.
2. Sized end tangents on every fitting.
3. Precision quarter-marked ends that guide the work.
4. Engineered for full strength throughout.
5. Markings on every fitting clear and complete.
6. Cleanly machined bevels and lands.
7. All materials: Carbon and alloy steels, corrosion resistant alloys.
8. The world's widest range of types, sizes and weights.

TF TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS General Offices & Works: Chicago 90, Ill. (P.O. Box 485). Eastern Plant: Carnegie, Pa. Western Plant: Fontana, Calif. • District Offices—New York: 50 Church Street • Philadelphia: Broad Street Station Bldg. • Pittsburgh: First National Bank Bldg. • Chicago District Sales: 208 S. LaSalle Street • Houston: City National Bank Bldg. • Los Angeles: Subway Terminal Bldg.

Please send a copy of your new catalog 484 covering welding fittings and forged steel flanges.

Name_____

Position_____

Company_____

Street address_____

City_____ Zone____ State_____

Mail to Taylor Forge & Pipe Works, P.O. Box 485, Chicago 90, Ill.

OIL and GAS EQUIPMENT Digest

THE OIL AND GAS JOURNAL

offers this "Check It" service for the convenience of its busy readers who realize the need to keep informed on the many items of new or improved equipment that are continually being introduced.

Postage Will Be Paid by Addressee

No Postage Stamp Necessary if Mailed in United States

BUSINESS REPLY CARD

Permit No. 3A, 510 P. L. & R., Tulsa, Oklahoma

THE OIL AND GAS JOURNAL

BOX 1260

TULSA, OKLAHOMA

Postage Will Be Paid by Addressee

No Postage Stamp Necessary if Mailed in United States

BUSINESS REPLY CARD

Permit No. 3A, 510 P. L. & R., Tulsa, Oklahoma

THE OIL AND GAS JOURNAL

BOX 1260

TULSA, OKLAHOMA

KEEP INFORMED!

this EASY way

SAVE TIME

TEAR OUT CARD

CHECK IT

MAIL IT

THE OIL AND GAS JOURNAL

offers this "Check It" service for the convenience of its busy readers who realize the need to keep informed on the many items of new or improved equipment that are continually being introduced.

Keep informed on what is new in equipment that will work for increased efficiency and lower costs in your operations. *Save Time* by using only one card to get information on every item of interest to you. *Tear Off* the card below. *Check It. Mail It.*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

For further information—without obligation—I have checked numbered circles above

Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, JULY 7, 1949

PLEASE PRINT

COMPANY NAME .....

STREET ADDRESS .....

CITY ..... ZONE NO. ..... STATE .....

NAME ..... TITLE .....

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

For further information—without obligation—I have checked numbered circles above

Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, JULY 7, 1949

PLEASE PRINT

COMPANY NAME .....

STREET ADDRESS .....

CITY ..... ZONE NO. ..... STATE .....

NAME ..... TITLE .....

No Postage Required

OIL AND GAS EQUIPMENT Digest

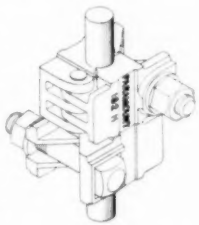
IT'S NEW CHECK IT

by Dan B. Miller

(1) MANUALLY OPERATED PILOT MIXER for testing heavy lubricating oils in test lots of approximately 5 gal. is made of standard welded-steel construction, in two sections, using a U-type agitator operated by means of a hand crank mounted on the agitator shaft. Removal of upper shell section, complete with agitator and all temperature and pressure gages, is easily effected by removing the six swing bolts. Loading and discharge of testing material is quick and positive. The entire mixer is designed for either suspension on trunnions over a controlled heat source or for location on a stand or pedestal for mixing viscous material not requiring external heat. *L. O. Koven & Brother, Inc.*

IT'S NEW CHECK IT

(2) IMPROVED POLISHED-ROD GRIP incorporates the flexibility and gripping qualities of former models, but offers a varied use which will mean long-run economy to the user. These grips come in single units which are hinged on one side and close with a high-tensile bolt on the other. Since the bolt need never be removed from the grip when applying or removing, there are no loose parts to handle or mislay. These single-grip units are accurately machined on the top and bottom so that they may be applied in combinations of two, three, or more, according to the needs of the well load. *Paramount Equipment Co.*



IT'S NEW CHECK IT

(3) HYDRO-PNEUMATIC ACCUMULATORS are manufactured to meet requirements of low cost, simple operation, safety and dependability, operation efficiency, and ease of installation and maintenance. The complete assembly is made up of a steel-alloy shell or housing, a synthetic-rubber separator bag or bladder incorporating an integrally molded high-pressure air valve, and an oil-plug assembly. The oil-discharge plug is installed in the wide port in the lower end of the shell with a high-pressure synthetic-rubber "O" ring used to effectively seal the chamber against leakage. A forged-steel, spring-loaded poppet controls the flow of oil, maintains high volumetric efficiency, and prevents extrusion of the rubber bladder. *Greer Hydraulics, Inc.*

IT'S NEW CHECK IT

(4) SUPER-SIZE NOZZLE SAFETY RELIEF VALVE with 8-in. inlet and 10-in. outlet, has been designed to meet the constant demand for such a valve, working particularly at lower pressures, and for refineries, where low pressures and high temperatures are involved. Orifice diameter of the new giant valve is 5 in. with an area of 19,635 sq. in. It is designed for 300-lb. top pressure. Body is of cast steel with stainless-steel trim. Over-all height of valve is 46 in. with plain cap, or 50 in. with packed cap. Weight is 975 lb. *Farris Engineering Corp.*

IT'S NEW CHECK IT

(5) HIGH-PRESSURE CONTINUOUS-DUTY SOLENOID VALVE has been developed for hydraulic systems with operating pressures to 3,000 psi. Compact in size, this valve is designed for continuous duty, operating on 110-volt, 60-cycle alternating current. Poppet-type construction eliminates internal leakage and allows full-line flow when opened. The valve may be mounted in any position. Impregnated coils, which are oil and moisture resistant,

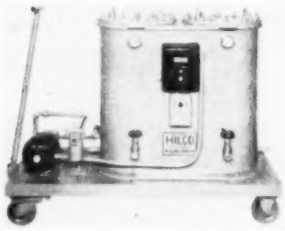
The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

make this valve suitable for mounting in oil reservoirs. Available in ⅜-in. size. *Waterman Engineering Co.*

IT'S NEW CHECK IT

(6) HILCO PORTABLE OIL FILTER is conveniently arranged for wheeling up to diesel engines or other equipment containing lubricating oil which requires periodic filtering. The unit consists of a filter assembly with or without electric heaters, and contains one or more filter cartridges. The cartridges can be packed with Hilite-fuller's earth for the filtration of straight-run mineral oils, of Hiltex-cellulose for the filtration of heavy-duty or compound oils. The entire unit is assembled on a base with ball-bearing casters, rubber tired, and with a drawbar for moving the unit. *Hilliard Corp.*

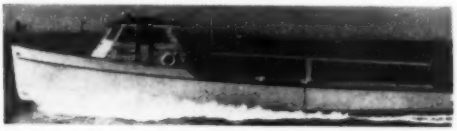


IT'S NEW CHECK IT

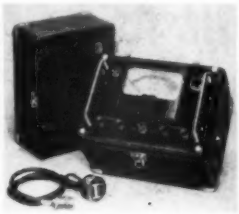
(7) QUICK-ACTING FIRE EXTINGUISHER is a self-contained unit with no extra gadgets protruding or complicated operating instructions. It is free flowing, having no syphon tubes or valves within the cylinder to become clogged or inoperative. A special dry chemical formula was developed to insure proper flow. The discharge hose and nozzle remain empty until fire extinguisher is actuated. Two sizes, 20 and 30-lb. capacity, are available. The dry chemical is nonconducting, noncorrosive, nonfreezing, and nontoxic and is highly effective on flammable liquid. *C-O-Two Fire Equipment Co.*

IT'S NEW CHECK IT

(8) PERSONNEL BOATS, designed and built for operations in the Persian Gulf, are attracting considerable attention from petroleum men in other areas where water transport is a factor. They provide maximum capacity, sturdy construction, and speed and maneuverability considerably greater than required of the average work boat. Three models, all with the same basic design and construction are being built: The personnel boats with capacity of 81 persons; staff boats with enclosed cabins and other refinements for added comfort; and a combination pilot and fire boat which will also operate as a tug. All are of welded-steel construction, powered with twin diesel engines. *Fellows & Stewart.*

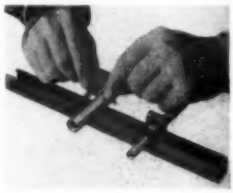


(9) COATINGAGE, an instrument for measuring the thickness of nonmagnetic coatings on iron or steel. Makes measurements rapidly, without damage to the coating, and the thickness is indicated directly on the meter of the instrument. Two concentric scales cover a range of 0.0001 to 0.50 in. The instrument's light-weight and self-contained battery power supply permit its use in the field as well as in the laboratory or on the production line. Typical applications include measurement of the thickness of paints, enamels, metal plating, protective coatings, scale, or coke deposits. Power is furnished by two 67½-volt batteries and one 1½-volt battery, contained in the instrument. *Branson Instruments, Inc.*



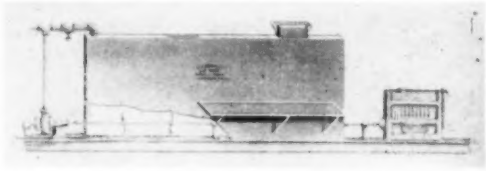
IT'S NEW CHECK IT

(10) UNISTRUT SPRING-STEEL TUBING CLAMP is designed for use with the Unistrut slotted steel channel to accommodate tubing sizes from 3/16 to 1 in. This new clamp permits fastening of each tube individually, its respacing, relocation, or removal, all of which can be done in a matter of seconds. Clamp allows expansion and contraction, yet holds tubing firmly in place. Where a change in tube mounting position is necessary, adjustment is fast and easy. *Unistrut Products Co.*



IT'S NEW CHECK IT

(11) MEDEARIS MASTER MUD MIXER is a compact, skid-mounted, easy-to-transport unit, designed to provide the fastest method of mixing and controlling mud, at the lowest possible cost. The mud mixer thoroughly mixes and transfers 300 gal. of mud per minute through its 40-bbl.-capacity tank. The unit is economical to operate and maintain. Split-type lubricated bearings permit bearing replacement without removing the shaft. Horsepower required is 22 at 1,400 r.p.m. *Medearis Oil Well Supply Co.*



IT'S NEW CHECK IT

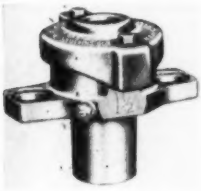
(12) DRY PREMIXED RAMTITE, a new plastic refractory, will not dry out in storage, because it is shipped dry but premixed at the factory, so that no additional mixing is necessary. Just spread out, add water, and it is ready for immediate use. It can be stored indefinitely without special precaution because exposure to freezing temperatures or hot dry atmosphere will not cause any damage. It is always available for emergency use. *Ramtite Co.*

IT'S NEW CHECK IT

(13) PORTABLE CONVEYOR. Lightweight, tough Tenite plastic is used for the rollers on this portable conveyor with aluminum or magnesium frame. The conveyor, designed for loading and unloading from trucks, and for interdepartmental handling is made in sections of 10 ft., each weighing 31 lb. and with a distributed load capacity of 500 lb. per 10-ft. section. Sections can be hooked together in a series. Over-all width of the conveyor is 12⅛ in. The rollers replace steel tubing and skate wheels for this application. Tenite is resilient, has high impact strength, resistance to outdoor exposure and dirt, and is corrosionproof. *Alvey Conveyor Manufacturing Co.*

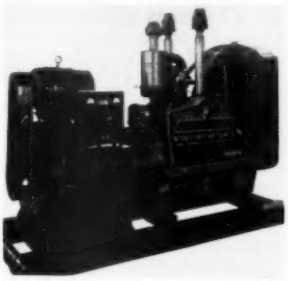
IT'S NEW CHECK IT

(14) SELF-LUBRICATING UPPER GLAND to fit all Hercules polished-rod stuffing boxes, is designed with a minimum of parts and for easy installation and economical operation. It is especially recommended for pumping wells where there is excessive wear on the polished rod or liner, also for wells which pump fluid intermittently. This lubricating upper gland has provided a saving to the operator by greatly increasing the life of the cone packing and by lengthening the life of the polished rod or liner. *Hercules Tool Co.*



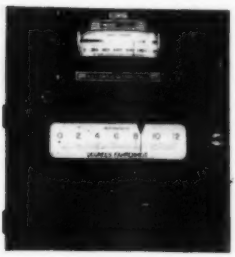
IT'S NEW CHECK IT

(15) PACKAGED ELECTRIC PLANT. The engine, an H-540 Le Roi, is eight-cylinder, four-cycle, operates on gas, butane, or gasoline, and is designed for maximum horsepower at a minimum weight. The continuous-duty rating is 30 to 50 kw., with intermittent duty rating up to 75 kw. The plant is supplied for permanent installation. *Carson Machine & Supply Co.*



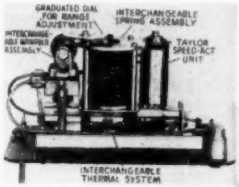
IT'S NEW CHECK IT

(16) MULTI-SWITCH CAPACITROL is for the measurement and control of process variables such as temperature, voltage, amperage, pressure, and speed. Incorporating such features as a distant view scale, front accessibility, plug-in. chassis design, and voltage selector plug, the Multi-Switch Capacitrol is available with a maximum of four switches to provide a selection of six different switching sequences for a large variety of control functions. *Wheelco Instruments Co.*



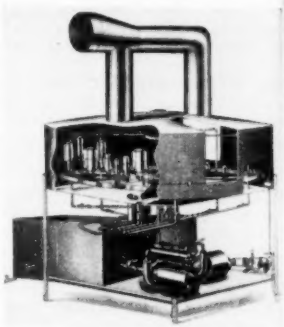
IT'S NEW CHECK IT

(17) TRANSAIRE WITH SPEED-ACT, a new force-balance-type pneumatic temperature transmitter is designed particularly for those applications where it is desirable to have the indication, record, or control remotely located from the point of measurement and where it is necessary to have accuracy, high speed of response, small thermal elements, and short range spans within the limits of minus 375° and plus 1,000° F. One of the outstanding features of this new instrument is the incorporation of Speed-Act which applies the principles of derivative action directly to temperature determination, overcoming the lag inherently present in the response of any form of thermal measuring element, and making possible a quality of measurement not before attainable. *Taylor Instrument Cos.*



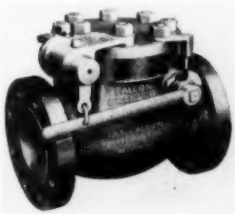
IT'S NEW CHECK IT

(18) OGDEN BOTTLE WASHER was developed in cooperation with refineries for their specialized use. Test models installed in refineries have shown considerable savings over the costs of previous, slower methods of washing. The washer is a compact, self-contained unit requiring a minimum of floor space. A unique feature of the machine is that it will accommodate bottles of all sizes up to 1 gal., operating equally well in cleaning narrow or wide-mouthed containers. Bottles are washed and dried inside and out. The production rate of eight bottles a minute may be varied according to the substance to be removed. The washer will successfully wash bottles which have contained substances from light oil to heavy greases and tar. *Ogden Filter Co.*



IT'S NEW CHECK IT

(19) SAFETY QUICK-CLOSING VALVE is designed primarily for refinery and gasoline-plant use. The valve operates either automatically or manually to instantly shut off the flow of gasoline or natural gas within the refinery, butane plant, or other fire-hazardous units. Built for high-pressure



work the valve fits into the line much like a check valve. The action or movement of the shutoff gate is triple action in that it may be operated by one of three different methods; either automatically through a fusible link or through a hydraulic or pressure system, or it may be operated manually from some remote point by means of a pull system. The valve is easily reset to its open position in a few seconds. Available in 2 to 8-in. sizes in cast steel, monel, or stainless steel trim. *Falcon Products, Inc.*

IT'S NEW ✓ CHECK IT

TRADE LITERATURE

(20) BULLETIN V-1000A describes new recording viscometers which have been specially designed for general use as process controls in industry. The viscometer has a very wide application. It can also be furnished in an explosionproof design for hazardous applications. *Norcross Corp.*

(21) CONDENSED CATALOG OF PUMPS. This 12-page brochure describes and illustrates a full line of pumps for many industrial applications and includes a capacity selection table and installation diagrams on each series. *Yeomans Brothers Co.*

(22) BLOWERS AND EXHAUSTERS contains 20 pages dealing with these heavy-duty cast-iron blowers and exhausters. It illustrates units for most applications and gives detailed volume and horsepower ratings on each. *Allen Billmyre Division. Lamson Corp.*

(23) ILLINOIS CHEMICAL PORCELAIN, an eight-page brochure, carries complete diagrammatic drawings and statistical tables on a complete line of porcelain valves and fittings. *Illinois Electric Porcelain Co.*

(24) HYDRAULIC PACKERS describes Hydroseal hydraulic packers, explains the principle of operation and its advantages, and illustrates a number of alternative methods for varying conditions. *Sweet Oil Well Equipment.*

(25) REPRINTS FROM THE DOW DIAMOND brings together all the articles carried in the company-published magazine dealing with Dowell's service to the oil and gas industry, including particularly, acidizing and chemical scale removal. *Dowell Incorporated.*

(26) VAREC ELECTRONIC GAGER, an eight-page brochure, devoted to the advantages of this method of remote gaging, presents installation plans for several sizes of tank batteries. *Vapor Recovery Systems Co.*

(27) DIAPHRAGM CONTROL VALVES offers descriptions and drawings of the diaphragm-motor-controlled valve with radiation fins and positioner; the direct-acting and reverse-acting diaphragm-motor-controlled valve with manual operator; the supersensitive pilot-operated valve, and the verturi throat valve. *Minneapolis-Honeywell Regulator Co.*

(28) DYNALOG INSTRUMENTS shown in an attractive 32-page bulletin, presents its complete line of Dynalog instruments for process measurement and control. Dimensional drawings and photos of instrument panels give all desired information as to installation of any of the instruments. *Foxboro Co.*

(29) THE ABC OF LARGE INDUCTION MOTORS, a special 32-page issue of the B-M Synchronizer covers in four parts the basic theory, operation, characteristics and applications, and control of large induction motors. *Electric Machinery Manufacturing Co.*

(30) DRYERS FOR AIR, GASES, AND LIQUIDS is a new, 32-page catalog featuring a comprehensive discussion of desiccant-bed drying of air, gases, and liquids. The catalog discusses the basic principles and specific factors affecting dynamic drying. *C. M. Kemp Manufacturing Co.*

(31) UNIT-FABRICATION is a folder on the advantages and economies of factory unit fabrication of welded piping headers, assemblies, and valve groupings into one-piece pretested units. *Crane Co.*

(32) PRELOAD TANKS discusses in detail the evolution, uses, design, and construction of these tanks. The 24-page book also contains complete specifications for building these structures. *Preload Corp.*

(33) MATERIALS OF CONSTRUCTION and packing materials for use with Flowrator instruments, with over 300 industrial liquids and gases are listed in a new and revised catalog. This tabulation of corrosion-resistant materials is based on previously published data, complemented by world-wide experience in handling corrosive fluids. *Fischer & Porter Co.*

(34) 85 PER CENT MAGNESIA INSULATION. Among the subjects covered are: properties, determination of correct thicknesses, application and finishing procedures, and maintenance. *Magnesia Insulation Manufacturers Association.*

(35) A PUMP IS NO BETTER THAN ITS BARREL is the title of new brochure which describes the advanced heat-treating and honing methods used in the manufacture of Oilmaster pumps. *Fluid Packed Pump Co.*

(36) STORAGE-TANK CAPACITY-SIZE CALCULATOR. A slide-rule type of calculator to show storage capacity in gallons and cubic feet in tanks of from 10 to 100 ft. in height and from 20 to 120 ft. in diameter. *Hammond Iron Works.*

(37) HIGH VACUUM EQUIPMENT. This is a bulletin containing technical information and descriptive data on high-vacuum pumps and accessory apparatus, systems, connections, and pumping speeds. *Central Scientific Co.*

(38) McKISSICK BLOCKS. This new catalog has been sectionalized, so that each classification of blocks has its own section. *McKissick Products Corp.*

IT'S NEW ✓ CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

POST TRACING PAPERS

P.T.M. 173

EXCELALL 179H

ONE FORTY 140

BLUTEX 175H

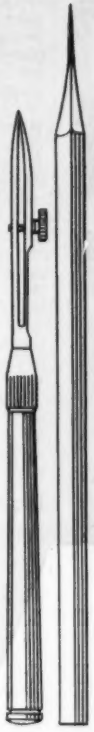
IVORY 167

MADE TO MEET YOUR REQUIREMENTS

Exactly!

Fitting the exact needs of draftsmen and engineers for over half a century, POST has sought to produce the finest product for each problem, purpose or need.

In tracing mediums, POST has perfected a specialized group of 5 papers which they believe exhibit a marked superiority over all competitive products—a superiority so obvious that a single trial is sufficient to establish their use as standard practice in your organization.



TRY

these 5 POST Tracing Papers under your operating conditions. Write for your free samples today —care of P.O. Box 1091, Chicago 90, Ill.

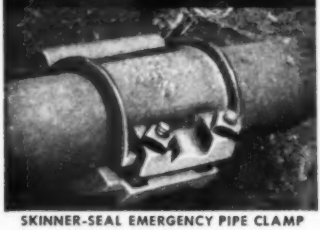
THE FREDERICK POST COMPANY

3650 AVONDALE AVENUE · CHICAGO 18, ILLINOIS · · Houston · Detroit · Chicago · Los Angeles · Milwaukee

Distributors in all Principal Cities

FOR EVERY PLAN YOU MAKE — — — THERE'S A PAPER BY POST

CRC
PIPE LINE CONSTRUCTION EQUIPMENT
CRUTCHER-ROLFS-CUMMINGS, INC.
Pipe Line Equipment and Materials
Houston - Tulsa

TO REPAIR PIPE LEAKS—
QUICKLY, PERMANENTLY
ANY PRESSURE — ANY TEMPERATURE

SKINNER-SEAL EMERGENCY PIPE CLAMP
for pinhole or corrosion leaks.

SKINNER-SEAL PIPE LINE CLAMP for
long splits and bad corrosion leaks.
In stock—all oil well supply stores
M. B. SKINNER COMPANY
SOUTH BEND 21, INDIANA, U. S. A.

PIPE LINES

Salt Lake Pipe Lines Asks For Bids on 560-Mile Line

Calls for construction bids on the initial portion of a 560-mile oil-products pipe line to be built from Salt Lake City into the Northwest have been issued by Salt Lake Pipe Line Co., a wholly owned subsidiary of Standard Oil Co. of California.

The announcement was made jointly by T. S. Petersen, Standard's president, and C. E. Finney, Jr., president of the pipe-line company.

The first leg of the pipe line, spanning the 320 miles between Salt Lake and Boise, Ida., is expected to cost more than $6,000,000. The line may later be expanded northward from Boise to a terminal in western Washington on the Columbia River. Total cost of the project is expected to exceed $12,000,000.

It has been designed to carry major oil products manufactured at Standard's recently constructed Salt Lake refinery. These include two grades of gasoline, as well as heating oil and diesel fuels.

Eight-inch pipe will be laid as far as Boise, but the pipe diameter for the remainder of the line has not yet been determined. Project construction, which will include a pumping station at the Salt Lake refinery, is to be started as soon as possible, with the hope that the line to Boise can be completed before the end of the year.

In addition to carrying products into the Northwest, the pipe line also will serve bulk storage plants along its route.

Montana-Dakota Utilities Asks Permit to Build Line

Montana-Dakota Utilities Co. has asked Federal Power Commission authority to construct a proposed $8,419,880 pipe-line project which would make available an additional 35,000,000 cu. ft. of natural gas daily to customers of the firm in Montana and North and South Dakota.

A joint application filed with the commission by Montana-Dakota and Montana-Wyoming Gas Pipe Line Co. includes plans for a 340-mile $12\frac{3}{4}$-in. pipe line extending from the Worland field in Washakie County, Wyoming, to Montana-Dakota's Cabin Creek compressor station in Fallon County, Montana; a combination gas compressor, dehydration, and sulfur-removal plant near the Wyoming origin of the line; and two branch lines, one connecting with the present gas-distribution system at Miles, City, Mont., and the other connecting with a distribution system to bebuilt by Montana-Dakota at Forsyth, Mont.

The 340-mile main pipe line and combination plant would be constructed and owned by Montana-Wyoming and operated under lease by Montana-Dakota. The branch lines would be constructed, owned, and operated by Montana-Dakota.

Southern Natural Seeking Increase in Line Capacity

Southern Natural Gas Co., of Birmingham, is seeking Federal Power Commission authorization to construct natural-gas transmission facilities designed to increase the capacity of two of its branch lines in Alabama and Mississippi and to supply natural-gas service to a cement company in Alabama. Estimated cost of the project is $1,226,070.

The company is proposing to build approximately 38.1 miles of branch loop lines; submarine crossings of the Warrior and Chattahoochee rivers; and a 7.4-mile extension of a branch line to provide service to the Southern Cement Co. plant in Shelby County, Alabama.

Construction of 31.3 miles of the branch loop lines and the crossing of the Warrior River is designed to increase capacity of the company's Montgomery branch line in Alabama from 76,300,000 to 87,300,000 cu. ft. per day, and the remaining 6.8 miles of looping, to be constructed in Mississippi, would increase capacity of Southern Natural's Meridian branch line from 12,000,000 to 13,000,000 cu. ft. per day.

The company said the submarine crossing of the Chattahoochee River, between Phenix City, Ala., and Columbus, Ga., would parallel an existing crossing installed on a bridge. The company explained that the bridge is subject to severe strains during high water periods and that installation of the submarine crossing would assure continued service to Columbus.

Jersey Central Asks Permit To Build 39.4-Mile Line

Jersey Central Power & Light Co., of Asbury Park, N. J., has asked Federal Power Commission to authorize construction of a 39.4-mile natural-gas pipe line in New Jersey connecting the company's coast division system with Texas Eastern Trans-

mission Corp.'s Big Inch line. Estimated over-all cost of the project is $1,208,200.

The proposed 10-in. line would connect with the Big Inch line near Bound Brook, N. J., and extend southeasterly to Jersey Central's gas-manufacturing plant in Long Branch, N. J. Natural gas received from Texas Eastern would be mixed with manufactured gas at the Long Branch plant for distribution in Monmouth and Ocean counties.

Texas Eastern previously was ordered by the commission to deliver up to 5,000,000 cu. ft. of natural gas per day to Jersey Central, which now distributes only manufactured gas in Cape May, Ocean, Monmouth, and Morris counties. The gas-service areas in Cape May and Morris counties will continued to be supplied entirely with manufactured gas, the application states.

Manufacturers to Connect With Hagerstown's Lines

Federal Power Commission Examiner Clifford R. Snider has issued an initial decision, subject to review by the commission, directing Manufacturers Light & Heat Co., of Pittsburgh, to connect its natural-gas facilities with those of Hagerstown Gas Co., of Hagerstown, Md., and to sell and deliver natural gas to the latter company for distribution in the Hagerstown area.

The order authorizes Manufacturers to construct a 2.8-mile pipe line to the Pennsylvania - Maryland state line connecting with a 3.9-mile line to be built by the Hagerstown company in Washington County, Maryland. Estimated cost of the project is $65,142 for Manufacturers and $154,751 for the Hagerstown company.

The examiner pointed out that demands on the Hagerstown company " are outstripping" its manufactured-gas capacity, and that neither the construction of additional manufactured-gas facilities nor an additional increase in rates necessary to continue service of artificial gas "appears feasible" to the company. The order directing the connection "is desirable in the public interest," the examiner continued.

By virtue of making natural gas available, there will be a saving in capital expenditures of $435,786 which would otherwise have to be incurred to increase the manufactured-gas facilities. In addition, the operating costs of the Hagerstown Gas Co. will be reduced an estimated $109,000 annually. Conversion from artificial to natural gas should also result in substantial savings to the consumers. The extent of such savings is a matter within the jurisdiction of the Maryland Public Service Commission.

Hagerstown's requirements from September 1949 through 1953 are estimated at approximately 13,200,000 to 20,000,000 cu. ft. of gas per month.

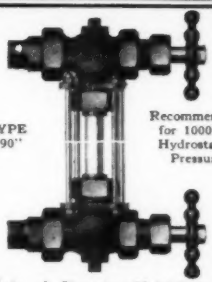
Portland Pipe Line Corp. Planning Parallel Line

Portland Pipe Line Corp. and Montreal Pipe Line Co., Ltd., are planning a project to increase capacity of their pipe-line system to handle estimated increase in throughput requirements over the next 10 years. The two firms now plan to build a second main line, 22 in. in diameter, from South Portland, Me., to Montreal East, Que., with construction to begin in June 1950. Completion is scheduled by November 1950.

The new line will be laid over the present right-of-way parallel to the present line and when completed will be operated in conjunction with the present 12-in. line. Capacity of the new system will average up to 140,000 bbl. daily and may, when required, be increased further by installation of additional pumps at each station. After the new line is completed the end of next year the firms will reduce their operating pump stations to the three located at South Portland and North Waterford in Maine, and Lancaser in New Hampshire.

At that time the firms will discontinue operating the pump stations at Raymond, Me., Gorham, N. H., and West Burke, Vt., as well as the pres-

PENBERTHY
DROP FORGED STEEL
LIQUID LEVEL GAGES



Made of Chromium-Molybdenum alloy temperature resisting steel, extra heavy throughout and stainless steel trimmed. Positive automatic shut-off; stainless steel balls shut off the flow of liquid if glass breaks. Regrinding removable seats, heavy duty stuffing boxes, union connections. Conform with A.P.I.—A.S.M.E. requirements.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

"Everything for the Pipeliner"

PIPE COATING and WRAPPING MACHINES
Stationary and Line Traveling

PIPE CLEANING and PRIMING MACHINES
Stationary and Line Traveling

American Steel Works
HEATING KETTLES

PIPE LINE SUPPLIES AND EQUIPMENT

PERRAULT Brothers INC.
1130 NORTH BOSTON
TULSA 6, OKLAHOMA
Phone 5-1104

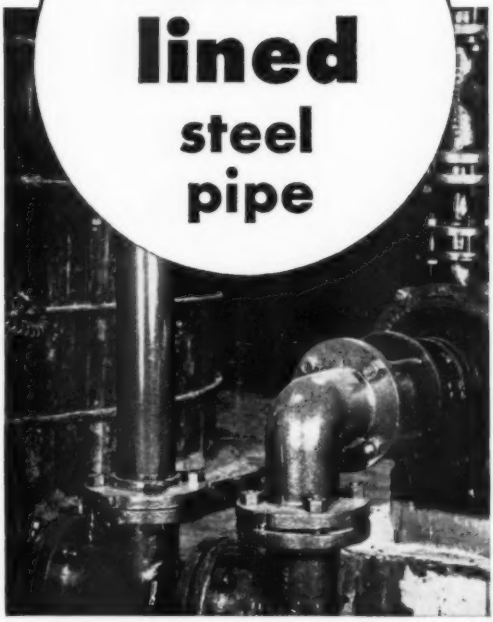
Cut & Bevel Any Pipe
With
Maximum SPEED
Minimum COST

The H & M PIPE CUTTING and BEVELING MACHINE
for 2 to 36-in. pipe

SPEED: Complete cut and bevel can be made on 12 inch pipe in about 2 minutes.
ECONOMY: Save approximately one-half labor and gas costs.
PORTABILITY: Can easily be carried from one pipe section to another.
Write for Literature and new, lower prices. Out Of Rounds attachment fits all machines.

The H & M
Pipe Beveling Machine Co.
311 East Third Street, Tulsa, Oklahoma

saran lined steel pipe



resists corrosion!

reduces shut-downs!
readily field-fabricated!
available immediately!
lower in cost!

Saran lined steel pipe is available in maximum lengths of 10 feet and in sizes from 1 to 4 inches inclusive.

Also available are saran lined plug valves, flanges, reducing flanges, flanged fittings, gaskets and fittings with union ends.

Write us today for further information concerning saran lined steel pipe and how it may solve your problem.

Manufactured by The Dow Chemical Company, distributed nationally by Saran Lined Pipe Company.

SARAN LINED PIPE COMPANY
702 Stephenson Building
DETROIT, MICHIGAN

Offices in: New York • Boston Philadelphia • Pittsburgh • Chicago Tulsa • Indianapolis • Houston San Francisco • Los Angeles Portland • Cleveland • Denver Seattle • Toronto

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

PUMPS

CENTRIFUGAL
RECIPROCATING

BUILDERS OF OUTSTANDING PUMPS
Since 1869

ESTABLISHED 1869

DEAN BROTHERS PUMPS INC.

INDIANAPOLIS IND.
323 W TENTH ST.

TOUGH and TRUE TURNBUCKLES

by Norris Brothers, Inc.

HUNDREDS OF THOUSANDS IN USE ALL OVER THE WORLD . . .

• Norris Brothers Turnbuckles are made perfectly true by a special straightening process. Ends are tapped in line, assuring true concentric pull. And as for toughness, we've turned them inside out and twisted them into a pigtail braid without a sign of fracture. Made in sizes and types to fit most needs. Ask your supplier, or write for circular.

Norris Brothers, INC.

ROBINSON · ILLINOIS

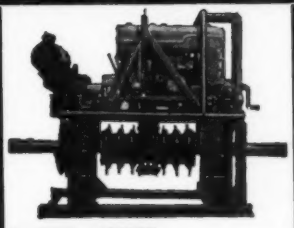
CROSE
PIPE CUTTING AND BEVELING MACHINE

EQUIPPED WITH OUT-OF-ROUND ATTACHMENT

Machines to cut and bevel 16" pipe and over are furnished with out-of-round attachment. Machines to cut and bevel 14" pipe and under are furnished with standard torch holder.

M. J. CROSE
MANUFACTURING COMPANY, INC.
MAIN OFFICE
2715 DAWSON RD. TULSA, OKLA.
BRANCH OFFICE
M & M BUILDING HOUSTON, TEX.

CROSE
MODEL M
CLEANING MACHINE



FASTER, BETTER
PIPE CLEANING . . .

with Crose pipe cleaning machines. Machines designed for pipe sizes from 2" to 30" diameter. Equipped for stationary or traveling operation. The machines with independent speed control on travel and priming head.

Standard models:

Model M—3" to 14" Pipe Cleaning machine
Model K—16" to 26" Pipe Cleaning machine
Cleaning and priming machines for larger pipe sizes also available.

Available on rental or outright sale basis.

M. J. CROSE
MANUFACTURING COMPANY, INC.
MAIN OFFICE
2715 DAWSON RD. TULSA, OKLA.
BRANCH OFFICE
M & M BUILDING HOUSTON, TEX.

ent two operating stations in Canada. As far as is known at present, the companies will anticipate that when the stations in the United States are shut down the end of next year, employes located at those stations will be retained at other locations.

The new project also includes construction of a new 30-in. discharge line from the tanker unloading pier to the Pleasantdale plant at South Portland, and construction of four additional 150,000 - bbl. floating - roof tanks at the latter point.

Champlin Refining Co. Is Subject to ICC Controls

Champlin Refining Corp., operator of a 516-mile gasoline pipe-line system extending from Enid, Okla., to Rock Rapids, Iowa, is subject to the Interstate Commerce Act., the Interstate Commerce Commission has ruled.

The firm has argued in a proceeding that it is not a common carrier and its pipe-line operation is not transportation within the meaning of the act. Two commissioners accepted this view in dissenting from the majority decision.

Basin-Ozark Line to Be Dedicated on July 12

Dedication ceremonies will be held in Cushing, Okla., on July 22 marking completion of the Basin-Ozark pipe-line systems. Cushing is the junction of the two lines.

Ceremonies will be part of a 4-day tour being planned for the press and members of the oil industry by the four owners of the crude-oil transportation system, Texas Pipe Line Co., Shell Pipe Line Corp., Sinclair Refining Co., and Empire Pipe Line Co.

The Basin system extends from Jal, N. M., to Cushing, a distance of 515 miles; the Ozark system extends from Cushing to Wood River and Patoka, Ill., a distance of 433 miles. The systems combined form the largest crude-oil carrier ever constructed by private capital.

Contract Let for 63-mile Line to Carthage Plant

Carthage Hydrocol, Inc., has awarded construction contract for its gas pipe line to H. B. Zachry Co., San Antonio. The 63-mile line will extend from gas fields in the San Salvador area to the Carthage synthetic-gasoline plant at Brownsville.

Starting at the San Salvador end, the line will be made up of 7 miles of 12¾-in., 16 miles of 14-in., and 40 miles of 16-in. pipe. Estimated cost of the pipe line is $1,800,000. Construction is under way.

Where Dependable Pipe Protection Begins...

Partial view of engineering department

How PIPE LINE SERVICE *Develops Its Own Special Machinery To Serve Customers Better*

This picture shows one of the reasons why Pipe Line Service is unmatched in the industry in providing complete, dependable pipe protection.

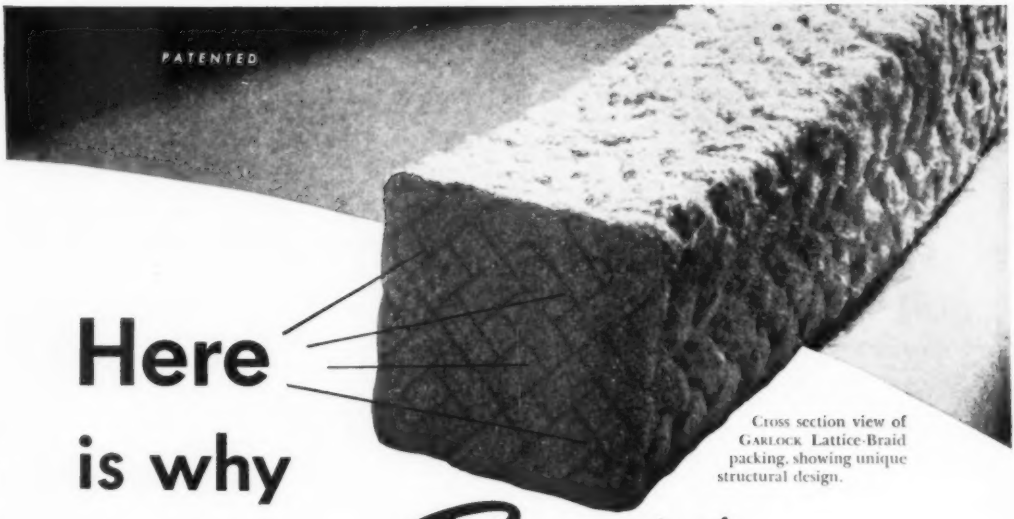
In this unique laboratory, engineers are constantly at work developing new methods for the various phases of steel pipe protection. Such important advancements as adequate cleaning equipment, including grit cleaning; also preheating ovens for warming pipe prior to coating, and similar developments originated in this department.

Equally important to the pipe user are the methods of control that have come out of this laboratory and are now used exclusively by Pipe Line Service. This scientific control has made possible uniformity of pipe protection not obtainable elsewhere.

Six plants, strategically located for the convenience of pipe users, offer this complete, controlled service that includes pipe cleaning, priming, coating, wrapping, pipe storage and delivery. Write for complete details today.

PLS

PIPE LINE SERVICE CORPORATION
General Offices and Plant · FRANKLIN PARK, ILL.
Plants at: Glenwillard, Pa.; Longview, Tex.; Corpus Christi, Tex.; Harvey, La.; Sparrows Point, Md.



Cross section view of GARLOCK Lattice-Braid packing, showing unique structural design.

Here is why Lattice-Braid Lasts Longer

ASBESTOS

GARLOCK 730—for hot or cold water at medium to high pressures.

GARLOCK 731—for steam, gases or water at temperatures up to 700° F.

GARLOCK 732 (wire inserted)—for heavy duty service against steam, oil, gases or water at temperatures up to 700° F.

GARLOCK 733—for hot or cold water or alcohol at medium or low pressures.

GARLOCK 734—for cold gasoline, kerosene and light oils.

GARLOCK 736 (blue asbestos)—for concentrated mineral acids.

FLAX

GARLOCK 740—for cold water at medium or low pressures.

GARLOCK 745—for heavy hydraulic service against cold water.

COTTON

GARLOCK 751—for hot or cold water.

The individual strands are braided *through and through* in an entirely different way by specially built braiding machines designed exclusively for manufacturing Garlock Lattice-Braid packing.

All braided strands are strongly lattice-linked together into a structural unit which holds together even when the packing is worn far beyond the serviceable limits of wear of ordinary braided packings.

The unique structural design of Garlock Lattice-Braid packing also provides unusual flexibility and built-in controlled porosity which imparts semi-automatic action and keeps the packing properly adjusted in the stuffing box.

Write for folder!

THE GARLOCK PACKING COMPANY
PALMYRA, N. Y.

Tulsa, Okla. Houston, Tex.
Los Angeles, Calif.

GARLOCK *Lattice-Braid* PACKING

NATURAL GAS

AEC Cost Figures on Gas Use Challenged

WASHINGTON.—Contention of the Atomic Energy Commission that economies would result from the substitution of natural gas for coal for fueling the Oak Ridge, Tenn., atomic-energy plant were challenged last week by Tom J. McGrath, general counsel for the Fuels Research Council.

McGrath, in a letter to Sen. Brien McMahon of Connecticut, chairman of the congressional joint atomic energy committee, asked an opportunity to appear before the committee to discuss a bill introduced by Rep. James E. Van Zandt of Pennsylvania to prohibit the use of natural gas at Oak Ridge.

The Fuels Research Council, representing railroad and coal interests opposed to expansion of natural-gas pipe lines, has been actively fighting the $10,000,000 Oak Ridge project, which a congressional subcommittee held in a report to McMahon to be totally unjustified on both economic and security grounds.

McGrath told the committee that while there might have been chances of a saving in fuel expense through the shift to natural gas when it was first proposed, "reductions in the price of coal have since materially decreased, if not entirely wiped out savings that might otherwise have accrued."

The Federal Power Commission, meanwhile, indicated that if any further action is to be taken with respect to the Oak Ridge pipe line it would have to be taken by Congress.

The commission denied requests for reopening and rehearing of the case, the first on the ground it was not timely and the latter on the ground it was without basis.

FPC Severs Ohio Phase From Tennessee Gas Case

Federal Power Commission has found that the issues involved in an effort to obtain a supply of natural gas for several northeastern Ohio communities from a proposed pipe line to be built by Tennessee Gas Transmission Co. should be determined separately, and has ordered this phase of the proceeding severed from the hearing on Tennessee's application.

A group of Ohio gas companies and communities intervened in the Tennessee proceedings. They are seeking a commission order directing Tennessee to provide service to the northeastern Ohio section. The company, which is planning a Kentucky-to-Buffalo, N. Y., extension of its pipeline system, asked a separate hearing with respect to the Ohio proposal, after indicating that it is willing to supply up to 17,000,000 cu. ft. of gas daily to that area.

The FPC order said that an application for authorization to build a pipe line to serve this same Ohio area is now pending before the commission. It was filed by Erie Gas Service Co., Inc., and also calls for Tennessee to supply the gas from its proposed Kentucky-Buffalo line. No hearing date was set in the severed proceeding.

The intervening companies involved in the case include Lake County Gas Co., Lake Shore Gas Co., Lake Shore Pipe Line Co., and Grand River Transmission Co.; and the communities of Willoughby, Wickliffe, Willowick, Mentor, Fairport, Eastlake, Grand River, and Painesville.

Michigan-Wisconsin Oral Argument Set for July 20

Oral argument has been scheduled by Federal Power Commission for July 20 in Washington, D. C., in the proceeding involving a joint application filed by Michigan - Wisconsin Pipe Line Co. and Michigan Consolidated Gas Co., for FPC authorization to construct, among others, additional natural-gas facilities in connection with Michigan-Wisconsin's Texas-to-Michigan pipe-line project, initially authorized by the commission in 1946.

The two companies had requested opportunity for oral argument. The commission also granted the companies' motion that intermediate decision procedure be waived.

The joint application involves, among others, a proposal to increase capacity of Michigan-Wisconsin's authorized 1,050-mile line by approximately 28 billion cubic feet of gas per year through installation of additional compressor units. The line as presently authorized by FPC would have a capacity of about 47 billion cubic feet annually.

Proposal by Interstate Natural Suspended by FPC

Federal Power Commission, pending hearing and decision, has suspended a proposed supplemental rate schedule filed by Interstate Natural Gas Co., Inc., under which there is a "disproportionate" reduction of that company's deliveries of natural gas to Texas Gas Transmission Corp. No hearing date was set by the commission.

New York City Gets First Natural Gas Next Month

The first use of natural gas in the New York City area is scheduled to begin about August 1 when New York & Richmond Gas Co. introduces the fuel in its system on Staten Island.

New York & Richmond, a manufactured-gas company serving approximately 38,000 customers on Staten Island, a borough of New York City, will receive natural gas from Texas Eastern Transmission Corp., operator of the wartime inch system which it bought and converted to natural gas. The New York Public Service Commission has authorized the New York & Richmond company to make the conversion.

Other gas companies in the New York metropolitan area are making plans to distribute natural gas on completion of Transcontinental Gas Pipe Line Co.'s system from Texas to New York. This is anticipated late next year.

Texas Eastern already has extended its lines to a measuring station site on Staten Island. It has contracted to deliver 4,000,000 cu. ft. daily to the New York & Richmond company. The conversion is expected to result in a savings of about $230,000 annually to the Staten Island consumers; the natural gas will have about twice the heating value of the presently used manufactured gas.

Natural Gasoline

Shell Planning Gasoline Plant in Provident Field

Shell Oil Co., Inc., has announced that it is preparing to build a gasoline plant at Provident City, 75 miles southwest of Houston, with handling capacity of 60,000,000 cu. ft. of gas daily. The plant will recover approximately 2,400 bbl. of liquid products daily from the wet gas from four different fields in the area.

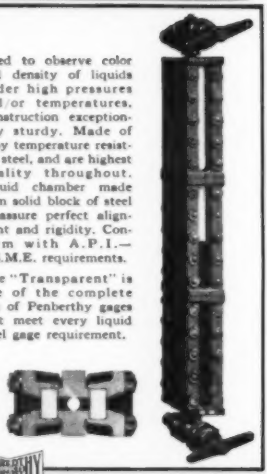
The plant, which is expected to be in full operation by the summer of 1950, will process gas from the Provident City, Hope, Brushy Creek, and Englehart fields. Residue gas from the plant will be sold to Texas Eastern Transmission Corp.

Contract for construction of the plant has been awarded, and work will begin immediately, Shell announced. Work on the gathering system has already begun.

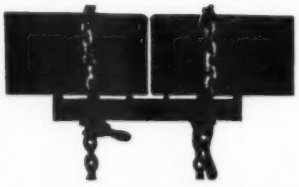
PENBERTHY
"TRANSPARENT"
DROP FORGED STEEL
LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures and/or temperatures. Construction exceptionally sturdy. Made of alloy temperature resisting steel, and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

The "Transparent" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.



PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO



WELD PIPE
Faster...Easier...Truer
WITH
JEWEL PIPE CLAMPS

They align pipe perfectly and hold it secure for tacking. On in a minute—off in ten seconds. Two sizes, ½ to 8 in.—8 to 16 in. Rigid construction resists strain, heat, and abuse.

Other Jewel Clamps for Ells, long and short turn—for Flanges—for Headers. Also Pipe Marker, eliminates patterns for holes and saddles.

So simple—so easy to use—Jewel Tools are proving big time-savers in refinery piping fabrication and erection.

Write Today for Details and Prices

Jewel Manufacturing Co.
1841 University Ave.
ST. PAUL 4, MINNESOTA

REFINING

M.E.K. Solvent Dewaxing Unit Placed on Stream

A M.E.K. solvent dewaxing unit is currently being placed on stream at the East Chicago, Ind., refinery of Sinclair Refining Co., completing a major expansion program for lube-oil manufacture.

The new unit will dewax daily 5,200 bbl. of neutral stocks or 3,200 bbl. of bright stocks, and will be used alternately to deoil 2,630 bbl. daily of crystalline waxes.

New propane - deasphalting and phenol-treating units were recently placed on stream at East Chicago providing complete facilities for producing fully refined waxes and lubes of 100 v.i. from Mid-Continent crudes.

New Expansion at Gulf's Philadelphia Refinery

Completion is scheduled for late this year on a 30,000-bbl. atmospheric-vacuum topping unit at Gulf Refining Co.'s Girard Point refinery near Philadelphia. The new unit is being built by Lummus Co.

Gulf's Philadelphia refinery has a rated crude capacity for 74,700 bbl. daily not including the new facilities. Sixteen 100,000-bbl. crude storage tanks are also under construction at the plant.

Changed Market Conditions Affecting Cosden's Income

Reflecting changed market conditions for independent refiners, R. L. Tollett, president of Cosden Petroleum Corp., in an annual report to stockholders for the year ended April 30 explains that 40 per cent of the yearly profits accrued during the first quarter of 1948 and only 10 per cent during the last quarter. The company operates a 17,000-bbl. refinery at Big Spring, Tex., and buys from other operators the bulk of the crude oil refined at the plant.

The report points out that prices on all refined products have declined in recent months affecting net income, with the greatest weakness in fuel oil, of which a high yield is secured at the company's refinery. The annual report states that a year ago the company was selling the Texas & Pacific Railway 195,000 bbl. of fuel oil monthly at an average price of $2.65 per barrel. Present sales total 65,000 bbl. daily and the price is $1.50 per barrel.

In an analysis of the company's earning and financial position the executive head said: "Our earning position would be temporarily improved by a reduction in crude-oil prices up to 70 cents a barrel, but for crude-oil prices to break by 50 per cent, which has happened within the past 9 months with respect to residual fuel oils, would result in serious losses and impairment of working capital."

The company is completing construction of a catalytic cracking unit at the Big Spring refinery and it is expected to be in operation by November 1.

Union at Pure Refinery Seeks 36-Hour Work Week

An Oil Workers International local union at Pure Oil Co.'s Smith Bluff, Tex., refinery near Port Neches is seeking a 36-hour work week without reduction in wages in negotiations for a new contract.

Approximately 800 plant and clerical workers are involved in the discussion. No general wage increases are being sought, but negotiations are said to call for various classification adjustments of wages.

Proposals for the 36-hour week are on the basis of weekly earnings for the present 40-hour week and union leaders stated the move for a cutback without reduction in "take-home pay" is to aid unemployment.

British American Plans to Expand Refining Capacity

TORONTO.—British American Oil Co. is planning to increase its refining capacity in western Canada. The announcement, made by J. Gerald Godsoe, executive president, indicated expansion would involve enlargement of existing plants rather than construction of a new plant. The company is spending about $4,000,000 this year in exploration and development in Alberta.

Shell Opens New Marine Terminal at Milwaukee

Shell Oil Co., Inc., has officially opened a new marine terminal at Milwaukee, the largest and most modern marketing facility the firm

has constructed since the war, H. S. M. Burns, president, announced.

The new plant occupies a 10-acre site and has storage tanks holding 10,250,000 gal. where petroleum products will be received and stored for distribution to customers in the surrounding area.

The terminal will handle about 20 separate products, Burns said, with gasoline, fuel oil, and kerosine constituting the greater bulk. About 42,000,000 gal. of these products will move through the plant each year. Other products include lubricating oil, aviation gasoline, paint solvent, and other special products.

Most products handled at the terminal are made at the company's Wood River, Ill., refinery, from which they move to East Chicago, Ind., through the company's products pipe line, and then via lake tanker to Milwaukee.

Gulf Modernizing Port Arthur Houdry Unit

Modernization is under way on the six-case Houdry catalytic cracking unit at Gulf Refining Co.'s Port Arthur, Tex., refinery.

The work consists of replacement of original cases with new-type jacketless cases, and installation of new finned tubes and new sheets of modified design. The unit has a reactor cracking capacity rated at 10,000 bbl. per stream day. Completion of the work is scheduled for this fall.

Catalytic Construction Co. has the contract for engineering, purchasing, and field supervision for the project.

Yields From Oil Taxes Lower Than Last Year

WASHINGTON.—Treasury revenue from the three oil taxes for the first 11 months of the current fiscal year showed an increase of $21,587,169 from the corresponding period a year ago—but for the first 5 months of the calendar year recorded a loss of $4,655, it was disclosed last week by the Internal Revenue Bureau.

The bureau's monthly report showed that the May receipts from the gasoline tax, which had dropped below the 1948 level in April, were ahead of the same month last year, $47,003,908 to $41,974,288, but that receipts from the tax on lubricating oils was under the 1948 figure for the fourth successive month, $7,523,763 against $12,040,849. Collections from the tax on pipe-line transportation also were under last year, for the second successive month, $1,595,841 against $$1,737,938.

For the 5 months ended with May, gasoline-tax collections were slightly above the corresponding period last year at $183,807,932 to $179,574,872, but lubricating-oil receipts dropped to $31,264,858 from $35,463,821 and pipe-line revenues to $7,531,312 from $7,570,075.

For the first 11 months of the fiscal year, however, gasoline-tax collections aggregated $455,492,712, a $23,958,225 increase over the $431,534,487 secured in the same period a year ago, and pipe-line receipts were $17,494,016, a gain of $831,378 over $16,662,638, but these gains were partially offset in a drop of $3,202,435 in lubricating-oil revenues, to $71,236,348 from $74,438,783.

RFC Closing Two of Its Synthetic Rubber Plants

WASHINGTON.—Because of a decline in the demand for synthetic rubber, the Reconstruction Finance Corporation has ordered the closing of two government-owned rubber plants in California.

California members of Congress were advised by the RFC last week that it is closing down the butadiene plant operated by Standard Oil Co. of California at El Segundo, and the copolymer plant operated by Goodyear Synthetic Rubber Corp. at Torrance.

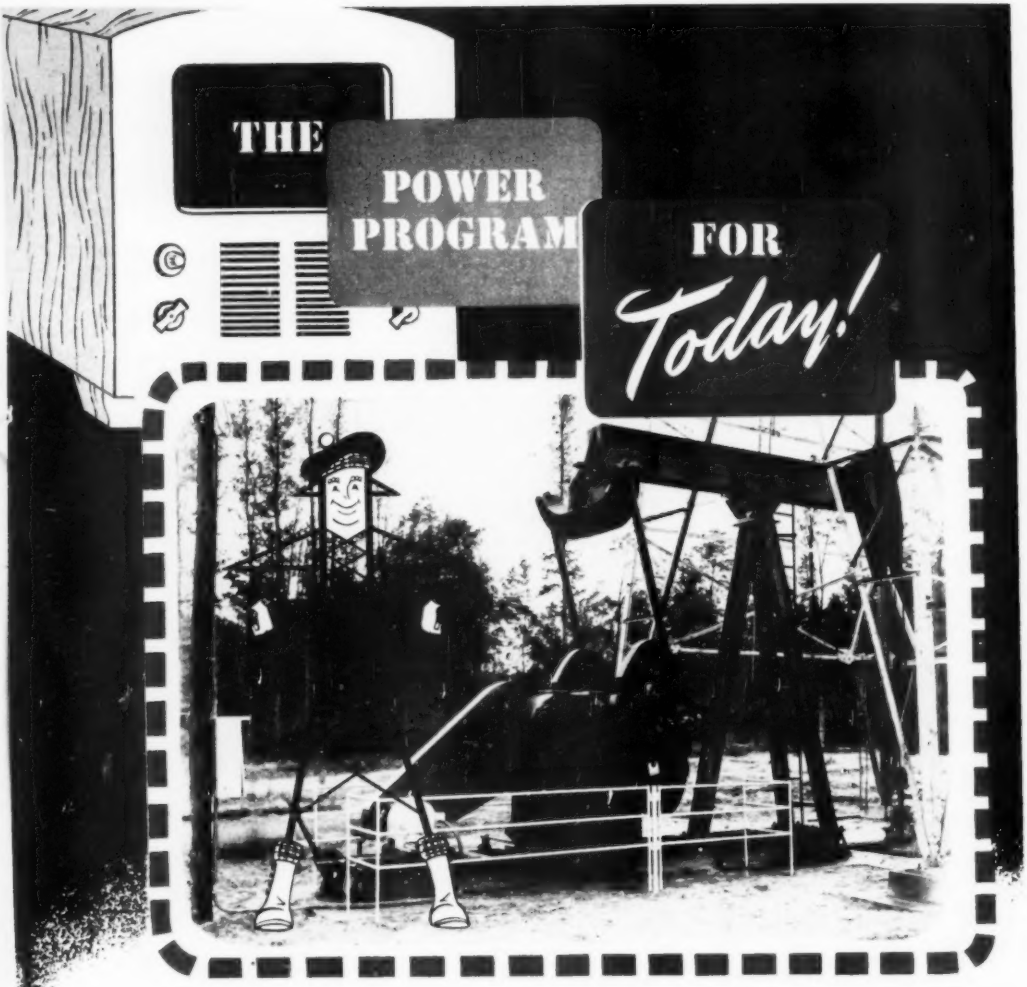
RFC officials said there has been a sharp curtailment in consumption of synthetic rubber which makes the production of the two plants surplus.

INDUSTRIAL
OIL AND GAS
BURNING
EQUIPMENT
AIROIL
NATIONAL
BURNER CO., INC.
1236 East Sedgley Avenue, Philadelphia 34, Pennsylvania
Texas Office: 2512 South Boulevard, Houston 6

"GUNITE" CONCRETE
(SINCE 1915)
LININGS FOR
BUBBLE TOWERS • SETTLERS • STILLS • SEPARATORS • TANKS • AND VESSELS OF ALL TYPES • ENCASING AND FIREPROOFING STRUCTURAL STEEL AND PIPE • LINING WATER RESERVOIRS, DITCHES, DRAINS, AND CANALS • REPAIRING DISINTEGRATED CONCRETE AND OTHER MASONRY.
See our catalog in Sweet's
GUNITE CONCRETE & CONST. CO.
1301 Woodswether Rd., Kansas City 6, Mo.
District Branch Offices
R. N. Turner, Dist. Mgr., 228 No. La Salle St., Chicago 1, Ill. B. H. Mueller, Dist. Mgr., 6625 Delmar Blvd., University City (St. Louis), Mo. Philip D. Barnard, Dist. Mgr., 2036 Addison, Houston 5, Tex.
Branch Offices: Denver, Dallas, New Orleans

Beautiful
INSTRUMENT
CABINETS!
Falstrom Builds Housings, Panels and Cabinets for all High Grade Industrial Components
. . . and Falstrom builds them with the same careful workmanship and attention to detail that characterize the products they enclose . . . fine design details, quality heavy construction, precision made internal supports and face cutouts, superb surface finishes. . . . but Bulletin 116 tells all! Write today.
FALSTROM
COMPANY
3 Falstrom Court, Passaic, New Jersey
ENGINEERS • DESIGNERS • FABRICATORS SINCE 1870

McCORD
"CLEARSITE"
SIGHT
FEED
McCord "Clearsite" plastic sight feeds provide a new degree of visibility and clearness, supplying positive proof of oil delivery. Due to its design this sight feed may be used as an independent sight at point of lubrication. As an accessory it can be added to any lubrication system. Specify "Clearsite."
McCORD "SF" LIQUID SIGHT FEED LUBRICATORS
A highly developed lubricator, particularly adapted to cylinder and bearing lubrication. Features: Precision built, most flexible and positive oil delivery system known. Supplied in 1 to 24 feeds. Specify McCord "SF" Lubricator.
For Sale by National Supply Co.
McCORD CORPORATION
DETROIT 11, MICHIGAN
LUBRICATOR DIVISION



ELECTRIC POWER FITS *TODAY'S* PICTURE

Power problems are as obsolete as an old crystal receiver set when LCP goes to work for you! Pumping . . . Pipelining . . . Refining—you name the job! Then let LCP show you real power performance! Costs less to install . . . Less to operate! Twenty-four hour efficiency . . . providing the required amount of power you need—when and where you need it! Ahead of tomorrow's developments . . . LCP will fit your power picture today! Get all the facts from the Power Engineer of your nearest Utility Electric Company!

Use Utility Electric Power!

PETROLEUM ELECTRIC POWER ASSOCIATION

Box 1498, Oklahoma City, Oklahoma

Among the Drilling Contractors

Hoover Drilling Co. Names Jones as Business Manager

Appointment of W. F. Jones as business manager of Hoover Drilling Co., Inc., Los Angeles, has been announced by O. J. Hoover, president. Donald Hoover, formerly associated with the company, has rejoined the organization as vice president and treasurer.

W. F. JONES

Other personnel changes include the promotion of Marshall Smith from toolpusher to drilling superintendent, and E. J. Hoover and Price Duffield, drillers, to toolpushers.

Permian Basin Drillers Sponsor Engine Courses

Sponsored by the Permian Basin chapter of the American Association of Oilwell Drilling Contractors, a training course in the care and operation of drilling engines is being offered drilling crews and others connected with the drilling industry in West Texas and New Mexico. The school, to be held at Odessa, will open July 11. Sufficient registrations already have been made to insure operation of the school a minimum of 6 months. Manufacturers, distributors and servicers of drilling engines are cooperating in making available engines and other equipment to be used in the training.

Joe Bradley, Davis Okla., has the contract to drill another test in the much exploited wildcat area southwest of the Pauls Valley field in Garvin County. It will be for Continental Production Co. of Oklahoma City and Leland Jones, and will be on the Barnett land in 34-3n-1w. Objective is the second Bromide pay. Seven other tests, all of which encountered shows, have been drilled in the area.

R. P. Medhurst, Medicine Hat, Canada, is moving in equipment to drill the Long Island-Birch Lake wildcat No. 1 in LSD 2, 30-51-10w4, Alberta Province, for which he has contract.

ROTARY RIGS IN OPERATION*

(United States and Western Canada)

Area—	Week ended 6-27-49	Change week ended 6-20-49	Change week ended 6-28-48
Gulf Coast	546	—10	— 26
W. Tex.-N. M.	512	— 7	— 75
Ark.-N. La.-E. Tex.	168	— 3	+ 2
Oklahoma	234	+ 4	— 70
Kansas	132	+32	— 5
Illinois-Eastern	118	— 9	— 30
Rocky Mountains	117	+10	— 39
Pacific Coast	179	—10	— 14
Total U. S.	2,006	+ 7	—257
Western Canada	71	— 1	+ 20
Total	2,077	+ 6	—237

*Courtesy Hughes Tool Co.

Left to right: Herb Benge, toolpusher; Guy Robinett, driller; E. C. Williams, Robert Strother, V. A. Jennings and R. J. Rowan, members of the day-tour crew for Helmrich & Payne, Inc., drilling contractor for Union Producing Co. in the Elk City field, Beckman County, Oklahoma

PENBERTHY
"REFLEX"
WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

USE 'BESTOLIFE IT'S BETTER

'BESTOLIFE—the Lead Seal Joint Compound used successfully in the Drilling and Refining Industries for years—is immediately available through more than 100 distributors in the U.S.A.

Your nearest supply house field store probably has 'BESTOLIFE in stock for immediate delivery. Use 'BESTOLIFE—it's BETTER!

EXPORT: THE NATIONAL SUPPLY CORP., 30 ROCKEFELLER PLAZA, NEW YORK

I. H. GRANCELL
1001 EAST MADEAU STREET
LOS ANGELES 1, CALIFORNIA

Since 1919

HINDERLITER

TUBING HEADS
CASING HEADS
CHRISTMAS TREES
TOOL JOINTS

HINDERLITER TOOL CO., DIV.
H. K. PORTER COMPANY, INC.
TULSA 1, OKLAHOMA

Contractors Plan Barbecue

The California chapter of the American Association of Oilwell Drilling Contractors will be host to members of the California oil and gas industry to be held at the Kern County Golf Club at Bakersfield August 18. F. A. York, Miller & York, Bakersfield, is chairman of the general arrangements committee.

Cook Drilling Co., Fort Worth, has been awarded contract to drill Atlantic Refining Co. 2 Tribal, second test for the Riverton Dome field in Fremont County, Wyoming. Contract depth is 12,300 ft. Location is ½ mile south of the discovery well.

Noble Drilling Co., Tulsa, has contracted to drill a 3,000-ft. wildcat test for Stanolind Oil & Gas Co. in the CIF Survey, northeastern Hansford County, Texas. Location is on the Francis lease in Section 18, Block 1.

C. A. Blue, cable-tool contractor, Titusville, Pa., is moving a rig to the Illinois - Indiana - Western Kentucky tri-state area. He will be located at Marion, Ky.

Williams-Copeland, Inc., Tulsa, is the contractor and joint operator with Allen Whiteside and W. J. Marten on the Wilcox sand wildcat test being started in 33-32s-2w, Sumner County, Kansas. Location of the test is 4 miles north and west of the Perth pool.

A. B. & W. Drilling Co., Wichita, is drilling for National Cooperative Refinery Association at a ½-mile south extension test for the Ruder pool in Ellis County, Kansas.

Prince Drilling Co., Houston, is moving in to drill Newman Brothers Drilling Co. 1 F. L. Roberts, a deep wildcat approximately 1 mile east of the huge Hastings field, BS&F Survey, Section 5, Galveston County, Texas. Projected depth is 10,000 ft.

Sam Tennant Drilling Co., Blackwell, Okla., is starting a Cromwell sand test for Swiss Oil Co. in 12-8n-8e, Hughes County, Oklahoma.

Adkins Drilling Co., Great Bend, Kans., has contract for its third well to be drilled for Carter Oil Co. in the latter's recently opened Davis Ranch field in Wabaunsee County, northeastern Kansas. The rig, which drilled both the discovery well and its north offset, will be used. The new well will be a south offset to the discovery well.

Kirk-Green-Way, Inc., is the contractor on a 6,500-ft. test being started by C. W. Chancellor and Slick Oil Co. in the L&SV Survey, north central Lubbock County, West Texas. The location is ¾ mile southwest of a small pumper completed several years ago.

Zephyr Drilling Co., Tulsa, is moving in a rotary rig to drill Forest Oil Corp. and Anderson-Prichard Oil Corp. 1-A Palmer County School Land, a wildcat in League 317, Gaines County, West Texas. Contract is for 8,000 ft.

W. C. Patton, Stillwater, Okla., is starting his fourth well for Deep Rock Oil Corp. on the Flora Duncan lease in 12-18n-4e, Payne County. This is a new producing area.

Longer Thread Life
WITH
Jimmie Gray
COMPOUNDS

EXCLUSIVE 500-TON SPECIAL

LONG-LIFE DRILL COLLAR COMPOUND

You can always break the joint when you use Jimmie Gray Compounds! That's because each one is engineered to do certain specified jobs best! You can depend on their thread-protecting film to prevent galling and washouts, too. Satisfaction is assured thru the famous Jimmie Gray money-back guarantee!

SOLD BY SUPPLY STORES EVERYWHERE

FORMERLY STANDARD OIL SALES CO.

PETROLEUM DISTRIBUTING CO.
BOX 703—HOUSTON, TEXAS
CHarter 4-5648

Standco
NO-SMOKE

STANDCO BRAKE LINING

Stands the gaff and gets the job done without scoring brake rims. See pages 3608-3613, Composite Catalog.

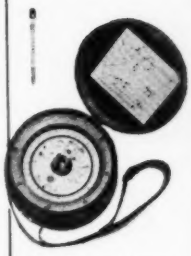
Standco Brake Lining Co.
HOUSTON

W&T Altimeters Save Time and Money

PRESENT day surveying and mapping techniques demand time-saving methods to help compensate for the high cost of field parties. W&T Sensitive Altimeters, combined with the Two Base Method of Precise Altimetry, provide a practical answer to the problem since they permit the establishment of vertical control in one-quarter to one-tenth the time required for spirit or trigonometric leveling. Accuracy meets the requirements of all but the most exacting work.

These instruments are available in several types and ranges — all are custom calibrated—and they can be furnished in matched sets. Design features include sensitivity to 1 part in 8000, light weight, choice of calibration and shock-proofed mechanism.

Write today for details on saving time and money with altimeter surveying.



W&T Sensitive Altimeter Type FA-185

W&T Sensitive Altimeter Type FA-112

WALLACE & TIERNAN
PRODUCTS, INC.
ELECTRICAL MECHANISMS AND PRECISION INSTRUMENTS
Belleville 9, New Jersey • Represented in Principal Cities

A-76

Keep your pipes clean!

NORTHRUP GO-DEVILS

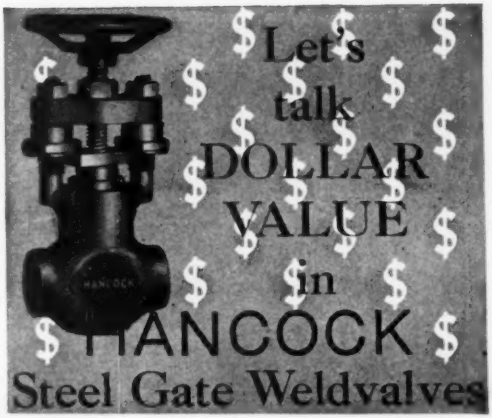
Disc-Cup Model — Size 6"

Sound design and top quality make Northrup Go-Devils clean thoroughly and last long.

Northrup Go-Devils are priced lower than others; yet they serve better and longer.

Every order shipped the day received

WASHINGTON ENGINE & PUMP CO.
Box 372, Washington, Pa.



TODAY, more than ever, value per dollar is just good, common business sense. And that's the basis on which we ask you to evaluate what you receive when you specify HANCOCK Steel Gate WELDVALVES.

For HANCOCK—*and only Hancock*—provides, as standard, these twelve important and dollar-saving features in steel gate valve construction:

1. Integral Stellite Seats—permanent, hard, corrosion and wear resistant.
2. No Bonnet Joint—No leakage, no gasket trouble and lagging costs minimized.
3. Dissimilar Materials In Seats and Wedges—an extra guarantee of long-life, no galling.
4. Self-Storing Gland—no wiring, tieing in place. A "plus" for the operator.
5. No Stem Pitting—all stems completely coated with a heavy cadmium plating.
6. Stainless-To-Stainless Back Seating—allows stuffing box shut-off around stem when valve is fully opened.
7. Gland Nut Threads Protected—the length of the nuts is greater than their maximum travel.
8. Packing Ease—plenty of packing space, packing of the highest quality, for the widest range of services.
9. Ball Bearing Stem-To-Wedge Connection—even distribution of load, easy operation, longer wear, less friction.
10. Safe, Comfortable Handwheel—sleekly scolloped for easy, sure and comfortable grip.
11. Interchangeable Parts—all wedges, stems and thread bushings to exacting, absolute uniformity.
12. Baked Enamel Exterior Finish—complete protection from corrosion of all external parts.

HANCOCK Steel Gate WELDVALVES are general purpose valves and designed for 800# at 750° F. or 2000# at 100° F. Size ¼" thru 2".

Stocked and sold by leading Distributors everywhere. Write to them or to us for full information.

MANNING MAXWELL & MOORE INC. TRADE MARK

HANCOCK *Valves*

A Product of
MANNING, MAXWELL & MOORE, INC.
WATERTOWN 72, MASSACHUSETTS

Makers of Hancock Valves, Ashcroft Gauges, Consolidated Safety and Relief Valves, American Industrial and Microsen Electrical Instruments, Builders of Shaw-Box Cranes, Budgit and Load Lifter Hoists

"LAY THAT PISTOL DOWN!"

Sure, oil exploration costs can be high . . . but you don't need such a drastic solution! A Mayes-Bevan Gravity Meter Survey gives you a reliable preliminary investigation that is ECONOMICAL! High priced, detailed exploration techniques are out of the question over a large potential producing province. Mayes-Bevan has the answer. Let them localize your areas, indicating in just which LIMITED sectors further, more elaborate, explorations should be profitable. So lay that pistol down . . . and send for Mayes-Bevan!

KENNEDY BLDG. MAYES-BEVAN GRAVITY METER SURVEYS COMPANY TULSA, OKLAHOMA

Exploration and Drilling

Confirming Well for Forest City Basin Success

THOSE geologists who have been optimistic about the future potentialities of the Forest City basin of northeastern Kansas are feeling better this week, as Carter Oil Co. 2 Davis, SW NE SW 33-13s-10e, offset to the discovery well, on drill-stem test, confirmed that the Viola production found in the discovery was not a one-well freak. *(See The Oil and Gas Journal, May 5, 1949, page 119).*

Two drill-stem tests indicated that the second well will be as good as, if not better, than the discovery. A test of the interval 3,202-24 ft., open 1 hour, 55 minutes, recovered 2,895 ft. of clean oil and 60 ft. of oil-cut mud, bottom-hole flowing pressure 1,075 psi., shut-in pressure built up to 1,150 psi. in 20 minutes. The next test at 3,225-35 ft., open 2 hours, 15 minutes, recovered 2,805 ft. of clean 27.8°-gravity oil, 10 ft. of oil-cut mud, and no water. Bottom-hole flowing pressure was 1,095 psi., shut-in pressure built up to 1,160 psi. in 20 minutes.

Previously coring of the interval 3,213-24 ft. resulted in the recovery of 6 ft. of dolomite, fairly porous and showing good saturation. Coring at 3,224-35 ft. resulted in recovery of almost 10 ft. of dolomite, of which about 4 ft. showed good porosity and saturation, and 1 ft. showed some crystalline and some saturation.

With surface elevation of 1,428 ft., the Davis confirming well had the top of the Mississippian at —1,059 ft., or 5 ft. higher than the discovery; Hunton top at —1,552 ft., or 11 ft. high; Maquoketa at —1,699 ft., 12 ft. high; and the Viola at —1,780 ft., or 9 ft. higher than the discovery.

This second well comes just as a slight damper had been put on the area by the result of one wildcat dry hole and another reported checking low in the general area. Four miles southwest of Carter's discovery, Sterling Drilling Co. et al 1 Hoch, NW NW SE 19-14s-10e, found the Viola 51 ft. low and dry, and was also dry in the Arbuckle. This well had slight staining show in the Viola, but no odor, at 3,322-37 ft., but on drill-stem test recovered 2,000 ft. of water, no oil.

Meanwhile reports from George Johnson et al 1 Casey, NE NE SW 31-15s-10e, about 12 miles southwest of the Carter discovery, indicated it was running 126 ft. low on the top of the Mississippi, after checking only 54 ft. low on the Kansas City.

Both of these wells are located not far from other Carter acreage, but unconfirmed reports that the way they are checking was no surprise to Carter geologists. Carter is known to have been able to work surface geology in this particular part of the area, although most of the Forest City basin is covered with glacial drift, making surface work impossible.

Some geologists, although optimistic for the long pull, have maintained all along that it will require careful feeling out after development of the first pool. When the structure and subsurface relations of the various unconformities are better known through development wells, and the wildcats that will be drilled as a result of the first good field, a much better picture will be available of the region. *Charles J. Deegan.*

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

ROCKY MOUNTAIN REGION.—British-American Oil Producing Co. is running casing at a very interesting wildcat, 1 Swenson, in Teton County, Montana, after finding scattered staining in the Devonian. The operator will acidize and test the well. Carter Oil Co. and Stanolind Oil & Gas Co. on test of their 1 Ute Tribal, Utah discovery, found the well made an hourly average of 68 bbl. of oil on 35-hour test. Continental 4 Unit established a new pay in Sussex field, Wyoming. Ohio 1 Egging, western Nebraska discovery, is pumping an average of 230 bbl. of 35°-gravity oil daily.

EAST TEXAS.—Delta Drilling Co. 1 Lillie Hoskins, third well in South Tyler Paluxy field of Smith County, was completed flowing 620 bbl. of oil in 18 hours through ¼-in. choke. The well is one of East Texas' largest producers, initially, and is expected to spur development of the area. Location is a north offset to the field's discovery, an 89-bbl.-a-day pumper. Second completion in the field flowed 231 bbl. a day.

WEST TEXAS.—Magnolia 2-30 Roy Glass, SE SW 30-40-TP, northeast offset to Pegasus field opener, topped the Pennsylvanian at 9,940 ft. on an elevation of 2,893 ft., which was said to be about flat with the discovery well. Magnolia's southwest offset, the 1-36 Glass, was drilling at 9,238 ft., in the lower Permian. Two miles southeast of the Pegasus area, Republic Natural Gas 1 Powell, Section 44, was taking sidewall cores in the Permian. It was dry in the Pennsylvanian at 10,520 ft.

NORTH TEXAS.—Bay Petroleum Corp. 1 William McGregor estate, 3 miles southwest of Vogtsberger Strawn field, was reported as Archer County's Bend conglomerate producer. The wildcat completed for a flowing potential of 46 bbl. of 42.8°-gravity oil daily from pay at 5,479-84 ft.

CANADA.—According to latest reports, one of the largest natural gas potentials ever reported in Canada has been set for Vermilion Consolidated Oils, Ltd.'s, 4 V. C. O., a 12-year-old wildcat reworked. The well, located in LSD 13, 32-47-5w4, showed a potential of 68,000,000 cu. ft. of gas on an open flow test. Western Leaseholds, Ltd., killed its well which blew wild with gas flowing at the rate of 8,000,000 cu. ft. daily, and is drilling ahead.

SOUTHWEST TEXAS

Duval County Gets New Production

CORPUS CHRISTI. — Southern Minerals Corp., Corpus Christi, is completing an oil discovery in southern Duval County, about 1½ miles southwest of South Longhorn field. The test is 1 Leroy Denman, 3½ miles east of Realitos, in Santos Garcia Grant. Hole was drilled to total depth of 5,605 ft. and production is through perforations at 4,253-58 ft. in Middle Cole sand. Production is 80 bbl. daily through ⅛-in. choke with 250 psi. tubing pressure.

A new deep oil pay zone is indicated for Rincon field, Starr County, in Continetal Oil Co.'s B-120 T. B. Slick estate in Survey 266, A-96. On drill-stem test at 6,221-26 ft., through ¼-in. choke, 100 psi. was developed and recovery included 270 ft. of oil-cut mud and 540 ft. of 38.7°-gravity oil. The well is drilling ahead.

Lewis Oil Co. A-3 Oppenheimer & Lang, oupost test to West Charlotte field, Frio County, is being completed on the pump from open hole at 5,561-78 ft. in Navarro sand. The well is in BS&F Survey 13 A-126 and total depth is 5,578 ft. Drill-stem tests at 5,557-60 ft. and 5,560-78 ft. recovered oil and developed very low working pressures.

Coastal Refineries, Inc., and Mayfair Minerals, Inc., 1 Pagels, a new pay discovery for McAllen gas-condensate field in Hidalgo County, has been gaged at 7,000,000 cu. ft. of gas daily through ¼-in. chokes through perforations at 9,370-9,410 ft.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCATS

Duval County: Humble Oil & Refining Co. 1 Enrique Garcia, 660 ft. from west and 1,400 ft. from south lines of Tract 2, Share 5, San Diego de Arriba Grant, 5 mi. NW San Diego, 124.89 bbl. daily, ½-in. choke, GOR 592, TP 910 psi., 48.6° gravity, TD 5,004 ft.

San Patricio County: Plymouth Oil Co. B-4 R. H. Welder, new pay in Sinton field, 30,000,000 cu. ft. of gas, on open flow, perf. 7,845-50 ft., TD 8,510 ft.

Starr County: British-American Producing Co. 2 T. B. Slick est., new pay in Yzaguirre field, Yzaguirre Sur. 230, perf. 4,890-902 ft., 6,200,000 cu. ft. of gas daily on open flow, TD 8,974 ft.

Williamson County: Anderson Prichard Oil Corp. 1 Charlie Preusse, R. E. Booth Sur., 6 mi. SE Taylor, 145 bbl. daily, 38.4° gravity, TD 1,138 ft., open hole 1,109-38 ft.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Aransas County: Graham & Spencer 1 C. B. Lucas, John Smith Sur. A-187, 2 mi. W Rockport, dry, TD 8,500 ft.

Bexar County: Armstrong & Sutton Drilling Co. 1 De Vilbiss, J. W. DeVilbiss Sur. 2,500, A-210, 14 mi. S San Antonio, dry, TD 2,248 ft.

F. M. Frasher 1 W. I. Whitt, Francisco Farias Sur., 18 mi. SE San Antonio, dry, TD 3,155 ft.

Caldwell County: Alton Laws 1 R. E. Brown, P. B. McCarley Sur., 10 mi. NE Luling, dry, TD 2,466 ft.

San Maceo Oil Properties 1 Gus T. Brown, Fishbaugh Heirs Sur., A-104, 3 mi. E Luling, dry, TD 3,372 ft.

Duval County: Argo Oil Corp. 2 J. M. Bennett, Jr., SK&K Sur. 451, 5 mi. SW Conoco Driscoll field, dry, TD 3,792 ft.

Guadalupe County: Riddle Oil Co. 1 Woods, L. W. Alexander Sur. A-41, 6 mi. SW Luling, dry, TD 3,100 ft.

Jim Hogg County: Continental Oil Co. 1 Daniel Gutierrez, M. J. Koeghan Subdivision, El Peyote Grant, 4 mi. NW Randado, dry, TD 3,210 ft.

McMullen County: W. E. Fox 1 Lawrence, C. C. Shumway Subdivision, Shiner Ranch, 10 mi. N Clegg Ranch, dry, TD 2,903 ft.

Travis County: Charles Rosener 1 Otto Schmidt, Pedro Rodriquez Sur., 3 mi. S Coupland, dry, TD 1,165 ft.

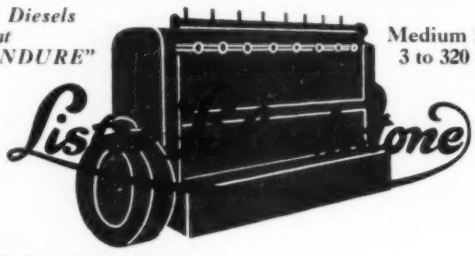
Tra-Tex Co. 1 H. Blomquist, William Tobin and Peter C. Harrison Surs., 17 mi. SE Austin, dry, TD 1,527 ft.

Tra-Tex Co. 2 H. Blomquist, P. C. Harrison Sur., dry, TD 1,003 ft.

Webb County: O. W. Killiam 2 Bruni est., 4 mi. S Bruni, dry, TD 4,045 ft.

O. W. Killiam 73 Bruni est., SE Lot 27, Foltz Subdivision, 3 mi. SW Bruni, dry, TD 3,610 ft.

"The Diesels That ENDURE"



Medium Speed 3 to 320 H.P.

★ DIESEL AUXILIARIES

Famed for years of pre-eminently economical and dependable performance for an extensive variety of stationary and marine auxiliary power and lighting requirements.

★ MAIN POWER PLANTS

In suitable engine types and horsepower ranges to meet the ramified requirements of main-engine installations for:

LIGHTING UNITS • POWER PLANTS • OIL FIELDS PUMPING IRRIGATION • REFRIGERATION

Write Us Your Requirements

LISTER-BLACKSTONE
INCORPORATED

Factory, Sales and Service Headquarters:
420 Lexington Avenue, New York 17, N. Y.

Parts Warehouses: MILWAUKEE, Wis., 3073 S. Chase Street
BOSTON, Mass., Whesco Building, Fish Pier

Agents: BOSTON, Diesel Engine Sales & Engineering Corp.; NEW YORK, Griffin Equipment Corp.; NORFOLK, Va., Curtis Marine Co.; NEW ORLEANS, La. (and in MOBILE, Alabama, and TAMPA, Florida), Calmes Engineering Co.; MIAMI, Florida, Auto-Marine Engineers; HOUSTON, Texas, Southern Engine & Pump Co.; NEWTON, Iowa, Winpower Manufacturing Co.; MONTREAL and TORONTO, Consolidated Engines & Machinery Co., Ltd.; WINNIPEG, Mumford, Medland, Ltd.; VANCOUVER, B. C., Hoffars, Ltd.; HALIFAX, Nova Scotia, Stairs, Son & Morrow; ST. JOHNS, Newfoundland, Clayton Construction Co.

Sold and Serviced in 37 Countries Throughout The World

EASTERN TEXAS

New Tyler Paluxy Pool Gets Third Producer

DALLAS.—Delta Drilling Co., Tyler, completed its 1 Lillie Hoskins, Oliver Anderson Survey, A-30, as the third producer in the new Tyler Paluxy pool of Smith County. The north offset to the discovery flowed 620 bbl. of clean 27°-gravity oil in 18 hours, through 5/16-in. tubing choke. On completion test, the well flowed 550.8 bbl. of oil a day, through ¼-in. choke, with gas-oil ratio of 366 cu. ft. Flowing pressures were 570 psi. on tubing and 620 psi. on casing. Corrected gravity was 30.6°. Perforations were in the Paluxy from 7,638-58 ft., with total depth 7,783 ft.

Humble Oil & Refining Co. was moving in materials for its 1 Fannie Watson, in the same survey, and 940 ft. north and west of Delta 1 Hoskins. It is Humble's second operation in the area.

In Harrison County, 7 miles northwest of Hallsville, Atlantic Refining Co. 1 M. P. Isom, E. A. Merchant Survey, was coring ahead below 7,633 ft. in sand and shale. In making a 60-minute drill-stem test at 7,540-90 ft., valves in the testing tool stuck open. Water cushion was 1,465 ft., which did not flow although the test developed a strong blow of air and brought gas to the surface in 55 minutes. Recovery in the pipe was the water cushion plus 59 stands of drilling mud, slightly gas-cut. Bottom-hole flowing pressure was 1,300 psi. Operators were unable to take the bottom-hole shut-in pressure.

R. W. Fair 1 Angus Wynne, Kaufman County wildcat 3¾ miles southwest of Cedarville, which has shown for commercial production from the Paluxy, was recementing casing at 4,987 ft.

Humble 1 J. W. Minton, Sabine County wildcat 9 miles northeast of Hemphill, was coring in lime and shale below 6,170 ft. From 6,110-60 ft., the 50-ft. recovery had 3½ ft. of nonporous lime and no shows, 4½ ft. of nonporous to slightly porous and gas odor on fresh break, and 42 ft. of lime and shale with no shows.

In Shelby County, 5 miles southeast of Joaquin, P. H. Pewitt 1 Ann Irish, Thomas Kilgore Survey, completed as a small gas-distillate discovery from the Hill zone at 4,870-82 ft. The well gaged 18,000,000 cu. ft. of gas a day, plus an estimated 7 bbl. of distillate per 1,000,000 cu. ft. of gas. Rock pressure was estimated at 1,775 psi.

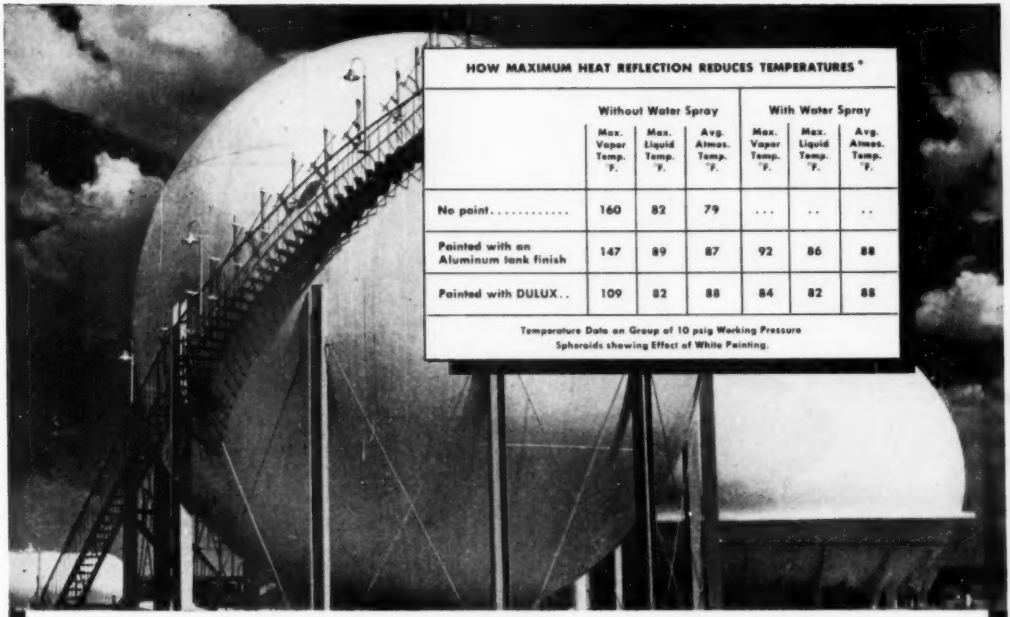
In Wood County, 3 miles south of Golden, F. R. Jackson 1 Joe Carr resumed pumping tests of the sub-Clarksville at 4,612-52 ft., yielding 25 bbl. of fluid in 14 hours. The 18°-gravity oil was cut an estimated 10 per cent by sediment.

EAST TEXAS (DISTRICTS 5 & 6-P) WILDCAT FAILURES

Red River County: Stratton Drilling Co., Inc., 1 Southern Pine Lumber Co., A. J. Witt Sur., 12 mi. NE Clarksville, dry, TD 1,886 ft.

Cherokee County: R. J. Caraway 1 Ray Magee, E. Moseley Sur., 6 mi. S Rusk, dry, TD 5,173 ft.

Franklin County: Byars & Peveto 1 A. Tulley, SPRR Sur., 10 mi. N Mt. Ver-



HOW MAXIMUM HEAT REFLECTION REDUCES TEMPERATURES*

	Without Water Spray			With Water Spray		
	Max. Vapor Temp. °F.	Max. Liquid Temp. °F.	Avg. Atmos. Temp. °F.	Max. Vapor Temp. °F.	Max. Liquid Temp. °F.	Avg. Atmos. Temp. °F.
No paint.....	160	82	79	...	..	..
Painted with an Aluminum tank finish	147	89	87	92	86	88
Painted with DULUX..	109	82	88	84	82	88

Temperature Data on Group of 10 psig Working Pressure Spheroids showing Effect of White Painting.

Du Pont DULUX Tank White

REG. U. S. PAT. OFF.

pays its own way . . . and more!

You can readily see why Du Pont DULUX Tank White is fast becoming the favorite tank finish in the petroleum industry when you study the chart above. It shows how the superior heat-reflecting ability of DULUX *lowers* interior tank temperatures . . . and thereby *minimizes* heavy evaporation losses in warm weather.

Using DULUX pays other dividends, too. DULUX provides unusually high resistance to premature corrosion, common fumes and industrial gases. DULUX means low repaint costs because less extensive surface preparation is required. And through its self-cleaning feature, DULUX stays white . . . gives *years* of maximum heat reflection!

To get long-term protection at low maintenance cost . . . to preserve the quantity and quality of your product at its peak . . . finish with Du Pont DULUX Tank White!

READ HOW *Du Pont DULUX Tank White can save you money two important ways. Send coupon today for "BEAT THE HEAT," an informative booklet complete with charts and other technical data on DULUX.*

Send for Free Booklet Today!

*Table from National Petroleum News, Technical Section

E. I. du Pont de Nemours & Co. (Inc.)
Finishes Div., Dept. O-97 Wilmington 98, Delaware.

Please send, free of charge, your new illustrated booklet **"BEAT THE HEAT."**

*Name*_____ *Title*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

DU PONT
REG. U. S. PAT. OFF.

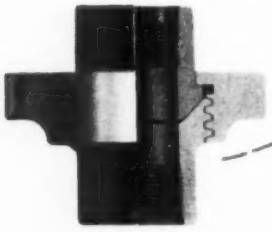
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

First, last and always a working dog, the German Shepherd is distinguished for dependability, and courage, and the ability to adapt himself to numerous services. Poised and unexcitable, he imparts a feeling of confidence to those whom he serves, whether he's guarding sheep, doing police work or serving as an eye for the blind.

Ordinarily, he's not an ill-tempered brawler, but woe be it to the man or animal who interferes with the discharge of his duties. When need be, he is a fearless fighter, with courage and physique equal to 'most any task his sense of duty prompts him to undertake.

Natural courage and intelligence, coupled with years of careful development, well conditioned the Shepherd for his most spectacular duty. When the need arose for war dogs, he received first call. Thousands of G.I.'s with whom he served relied upon him for protection and assistance. It was a well-placed reliance . . . even in this most extra-ordinary service, the German Shepherd kept untarnished his reputation for loyalty and dependability.

Through many years' service under varied conditions, WECO Unions likewise have established an outstanding record for dependability. They, too, have been carefully developed and proved for many duties. Wherever they are used, they stand as symbols of security . . . finest protection available anywhere. They're sold through all leading supply stores.



WELL EQUIPMENT MFG. CORP.
Subsidiary of Chiksan Company
Houston 1, Texas
Exclusive Sales Representative Outside Mid-Continent Area
CHIKSAN COMPANY
Brea, Calif. New York 7
Export Sales: CHIKSAN EXPORT COMPANY, Brea, Calif. New York 7

WECO
Manufacturers and Distributors of Oilfield, Refinery, Marine and Industrial Equipment

non, dry, TD 4,436 ft., Pecan Gap 1,625-1,783 ft., Eagleford 3,138 ft., Woodbine 3,671 ft., Georgetown 3,765 ft., Goodland 4,384 ft., Paluxy 4,405 ft., reported making 35 bbl. oil, plus considerable water on the pump, from the Paluxy.

KANSAS

Second Producer Assured For New Davis Ranch Pool

THE recently opened Davis Ranch field in Wabaunsee County in the northeastern part of the state, is assured a second good well in Carter Oil Co. 2 G. H. Davis, SW NE SW 33-13-10e, a quarter mile north of the discovery producer. Viola lime, the pay zone, was topped at 3,208 ft. (—1,780 ft.), 9 ft. higher than in the discovery producer. It was cored to 3,215 ft., and in a drill-stem test of the interval, a recovery of 2,780 ft. of oil and 40 ft. of oil-cut mud was recovered. Additional formation is being cored.

The discovery well, which topped the pay at 3,199 ft. (—1,789 ft.), was completed late in May with an echometer potential of 2,580 bbl. per day. On a previous pumping test it made 145 bbl. of 29° oil in 8 hours. It was bottomed at 3,206 ft. with casing at 3,202 ft. Location has been made for 3 Davis, a quarter mile south of the discovery well, in the SW NE NW 4-14s-10e.

Skelly Oil Co.'s new oil discovery, 1 Galliart, NW NW NE 2-23-16, Pawnee County, flowed 111 bbl. of 50° oil on potential test with production from the Arbuckle at 4,098-4,107 ft. (—2,078-87 ft.). It is a half mile south of gas production in the South Shady pool.

In the same county, Sunray Oil Corp. 1 Brown, NE NE SW 28-21-16, new pool opener, 3 miles south and 2 miles west of the Southwest Ash Creek pool, has been given a pump potential of 40 bbl. daily. It has casing perforated at 3,877½-78½ ft. in the Arbuckle, topped at 3,853 ft. (—1,828 ft.). Previously, it had flowed 5 bbl. of oil per hour with an estimated 4,500,000 cu. ft. of gas per day.

Rooks County has a new Lansing pool with the completion by Harry Gore of his 1 Cramm, NW NW NE 28-7-19, which has been given a potential rating of 66 bbl. per day. Production is from casing perforations at 3,331-39 ft. with Lansing topped at 3,156 ft. (1,180 ft.). Hole was drilled to the Arbuckle at 3,476 ft. and plugged back to 3,370 ft. The well is 3 miles south of Locust Grove production.

Gas production of the Hugoton field has been extended 8 miles west by Cities Service Oil Co. 1 Commissioners, NW NW SE 2-34s-41w, Morton County, which, with casing perforated at 2,300-05 ft. and formation acidized, flowed 517,000 cu. ft. per day. The well previously had made water with casing perforations at 2,498-514 ft.

KANSAS SUCCESSFUL WILDCATS

Graham County: M. B. Armer et al 1 Teall, NW NW SE 9-10s-21w, pumped 32 bbl. of 36°-gravity oil per day from Kansas City at 3,528-34 ft.; anhydrite 1,725 ft., Heebner 3,442 ft., conglomerate 3,775 ft., Simpson 3,800 ft., Arbuckle 3,818 ft., TD 3,822 ft.

Rooks County: Harry Gore 1 Cramm, NW NW NE 28-7s-19w, pumped 66 bbl. of 28°-gravity oil per day from Lansing at 3,337-46 ft.; anhydrite 1,465 ft., Heebner 3,126 ft., basal Kansas City 3,384 ft., Arbuckle 3,384 ft., TD 3,472 ft.

Russell County: Lindas Drilling Co. 1 Parker, SW SW SW 7-15s-12w, pumped 833 bbl. of 36°-gravity oil per day from Lansing at 3,086-3,102 ft.; anhydrite 786 ft., Arbuckle 3,360 ft., TD 3,368 ft.

Stafford County: M. B. Armer et al 1 Hildebrand, NE NE NW 11-24s-12w, pumped 96 bbl. of 40°-gravity oil per day from Viola at 3,819-30 ft.; anhydrite 635 ft., Lansing 3,431 ft., TD 3,830 ft.

Woodson County: C. W. Darling 1 Hare, SW

NW NE 32-25s-14e, pumped 6 bbl. of oil per day from Lansing at 677-92 ft., TD.

KANSAS WILDCAT FAILURES

Butler County: Inland Oil Co. 1 Ralston, NE NE SW 15-26s-3e, dry, TD 2,845 ft., Mississippian 2,745 ft.

McPherson County: Jones-Shelburne et al 1 Rump, NW NW SW 23-20s-4w, dry, TD 3,862 ft., Lansing 2,552 ft., Mississippian 3,216 ft., Viola 3,732 ft., Simpson 3,767 ft., Arbuckle 3,837 ft.

Rice County: Don Ingling 1 Wolf, SW SW SE 25-18s-7w, dry, TD 3,514 ft., anhydrite 460 ft., Topeka 2,508 ft., Heebner 2,548 ft., Lansing 2,722 ft., conglomerate 3,166 ft., Misener 3,230 ft., Maquoketa 3,316 ft., Viola 3,356 ft., Simpson 3,398 ft., Arbuckle 3,460 ft.

Saline County: C. E. Gould 1 Thelander, C S/2 NE SE 10-16s-3w, dry, TD 3,390 ft., Mississippian 2,828 ft., Viola 3,314 ft.

Sumner County: Woods Drilling Co. 1 Hollingsworth, NE NW SE 16-34s2e, dry, TD 3,880 ft., lime 2,350 ft., Stalnaker 2,375 ft., Layton 2,814 ft., conglomerate 3,468 ft., Mississippian 3,473 ft., Kinderhook 3,720 ft., Misener 3,770 ft., Simpson sand 3,774 ft., Arbuckle 3,828 ft.

Woodson County: Haney & Goodrich 1 True, NW SE SW 13-24s-15e, dry, TD 1,525 ft., Mississippian 1,449 ft.

Waubansee County: Sterling Drilling and Davis Childs 1 Hoch, NW NW SE 19-14s-10e, dry, TD 3,522 ft., Lansing 1,658 ft., Kansas City 1,816 ft., basal Kansas City 2,025 ft., Mississippian 2,627 ft., Kinderhook 2,950 ft., Hunton 3,127 ft., Maquoketa 3,254 ft., Viola 3,330 ft., Simpson sand 3,445 ft., Arbuckle 3,510 ft.

OKLAHOMA

Second Well Reaches Sand In New East Renfrow Pool

THE first confirmation test for the new East Renfrow pool in northeastern Grant County has found the Wilcox pay sand of the discovery well, and from indications given in drilling tests, looks like another good producer. It is Cities Service Oil Co. 1 Nelson, SW NW NW 5-28n-3w, a 10-acre, diagonal northeast offset to the discovery well, 1 Pratt, NE SE NE 6-28n-3w, drilled by the same company.

Two 90-minute drill-stem tests were made of sand at 4,981-90 ft. In first, 240 ft. of clean oil and 90 ft. of oil-cut mud was recovered. In the second, recovery was 2,841 ft. of gas-cut oil (estimated 75 per cent oil) and 205 ft. of salt water. Casing (5½-in.) has been cemented at 4,978 ft. preparatory to completing the well. The discovery well has the sand at 4,964-79 ft. and was completed in May flowing 124 bbl. in 24 hours through 14/64-in. choke.

A mile north of the discovery well, the same company apparently has a failure in its Wirt, NE SE NE 31-29n-3w, which got salt water in a drill-stem test of the sand at 5,002-50 ft.

Teepee Drilling Co. 1 Warner, C SE NE 4-6n-1w, new pool opener east of Lexington in southern Cleveland County, has been placed on the pump and in initial pumping tests made 36 bbl. of 48° oil in 24 hours. Previously, in one swabbing and flowing test it made 117 bbl. in 18 hours. Production is from an unconformity at 6,552-62 ft. at the base of the Pennsylvanian. Total depth is 6,655 ft. in the Hunton lime. Hole is open below 7-in. casing at 6,548 ft.

Production in the southern part of the Velma pool, Stephens County, is being extended eastward by two more stepout wells, Gulf Oil Corp. 1 James, SW SE NE 32-1s-4w, and Amerada Petroleum Corp. 1 Mary Cox, NW NW SW 33-1s-4w. The former, just east of production, swabbed 708 bbl. in a 15½-hour test through casing, and then swabbed and flowed 173 bbl. in 8 hours. Total depth is 6,299 ft. Amerada's well, a quarter mile further southeast of production, flowed 149 bbl. in 24 hours through 3/8-in. choke from open hole at 5,990-6,190 ft. Gulf is drilling or has made location for six additional wells around the two new producers.

OKLAHOMA SUCCESSFUL WILDCATS

Garvin County: Howell 1 Webster, SE SE NW 5-3n-2e, pumped 20 bbl. of 35°-gravity oil per day from sand at 3,140-51 ft., TD 3,552 ft.

Myers 1 Trudgeon, NW SW SW 14-4n-1w, 77 bbl. of 43.4°-gravity oil per day from sand at 4,428-36 ft., TD 4,716 ft.

Okfuskee County: Falcon-Seaboard 1 Sarnit, SE SE SW 14-13n-8e, flowed 10 bbl. of 38°-gravity oil per day from 3,440-45 ft.; Checkerboard 1,150 ft., conglomerate 1,238 ft., Big lime 2,160 ft., Oswego 2,211 ft., Verdigris 2,445 ft., Skinner 2,446 ft., Earlsboro 2,711 ft., Inola 2,895 ft., lime 3,078 ft., Booch 3,210 ft., Gilcrease 3,392 ft., Union Valley 3,425 ft., Cromwell 3,438 ft., TD 3,445 ft.

Pontotoc County: Grisso Oil Co. 1 Haney est., SE SE NW 22-4n-7e, 8 bbl. of oil and 6,000,000 cu. ft. of gas per day from Senora sand at 736-62 ft., TD 2,396 ft.

Seminole County: Villines 1 Millsap, NW SW NW 30-7n-6e, pumped 5 bbl. of 40.1°-gravity oil per day from Calvin, TD 2,504 ft.

Stephens County: The Texas Co. 1 Creel, SW SW NW 3-1n-5w, flowed 9 bbl. of 43°-gravity oil per day from bromide and Tulip Creek sands at 11,322-11,673 ft., TD.

Washita County: Bauman & Pray 1 Proctor, C NW 28-10n-20w, 5 bbl. of 48.5°-gravity oil and 1,500,000 cu. ft. of gas per day from granite wash at 10,030-14,582 ft., TD, (renewal).

OKLAHOMA WILDCAT FAILURES

Carter County: Van Drisso 1 Wolrz, NE SE NW 31-4s-1e, dry, TD 5,210 ft., basal Pontotoc and Hoxbar 706 ft., lower Dornick Hills 4,427 ft., Springer 4,733 ft.

Cotton County: Albritton 1 Pruitt, NW NW SE 33-2s-12w, dry, TD 1,973 ft., sand 1,250-80 ft., 1,375-90 ft., and 1,430-40 ft., sandy lime 1,648-62 ft., lime 1,756 ft., Megargle lime 1,942 ft.

Atkinson 2 Nowlin, NW NW SE 26-4s-11w, dry, TD 2,000 ft., sand 1,107-65 ft., 1,210-55 ft., 1,503-30 ft., and 1,767-92 ft., fusilinid lime 1,815-21 ft., Thomas sand 1,846 ft., first sand 1,846-70 ft., second sand 1,875-92 ft., third sand 1,945-60 ft., Megargle lime 1,987-96 ft.

Grimes 1 Benson, NE SE NE 36-4s-11w, dry, TD 1,818 ft., granite wash 715-35 ft., sand 760-76 ft., 990-1,025 ft., 1,075-1,105 ft., and 1,315-24 ft., Megargle (?) lime 1,705 ft.

Ford 1 Austin, SE SW SW 6-5s-11w, dry, TD 2,203 ft.

Creek County: Summers 1 Capp, SE SE NW 25-15n-7e, dry, TD 3,782 ft.

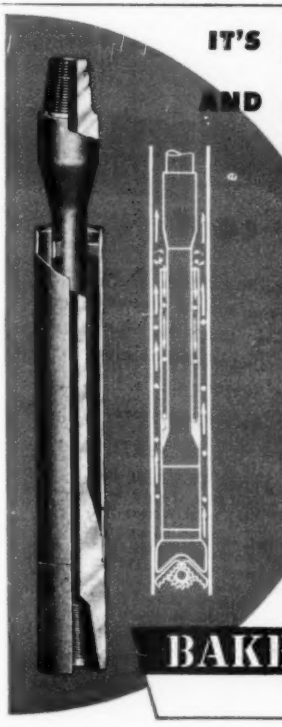
Garvin County: Armer Drilling 1 Walter, NE NE NW 8-1n-1e, dry, TD 5,210 ft.

Howell 2 Webster, NW SW NW 5-3n-2e, dry, TD 3,524 ft., McKinney sand 3,042 ft., upper Burns sand 3,082 ft., lower Burns sand 3,130 ft., conglomerate 3,180 ft. and 3,220 ft., bromide dense 3,274 ft., first bromide sand 3,320 ft., second bromide sand 3,426 ft., MsLish 3,520 ft.

Greer County: Stauffer 1 Shumate, NW NW NW 7-4n-20w, dry, TD 455 ft.

Kingfisher County: Atlantic 1 Choat unit, C SE SW 26-19n-9w, dry, TD 8,661 ft., Pawhuska 3,940 ft., Deer Creek 4,125 ft., Oread 4,563 ft., Avant sand 5,160 ft., Avant lime 5,225 ft., upper Layton 5,465 ft., lower Layton 6,050 ft., Checkerboard 6,495 ft., conglomerate 6,575 ft., Oswego 6,718 ft., Prue 6,911 ft., lime 7,036 ft., Red Fork 7,110 ft., Inola 7,180 ft., Mississippi lime 7,794 ft., Woodford 8,295 ft., Hunton 8,315 ft., Sylvan 8,615 ft.

McClain County: Mid-Continent 1 Boshears, C SE SE 23-8n-3w, dry, TD 10,151 ft., Dewey 5,950 ft., Hogshooter 6,464 ft., sand 6,725 ft., Mayes 8,390 ft., Woodford 8,426 ft., Harrington-Hunton 8,500 ft., Chimney Hill-Hunton 8,758 ft., Sylvan 8,793 ft., Viola 8,890 ft., bromide



IT'S SIMPLE AND PRACTICAL

The Baker Junk Basket aids in removal of cuttings when drilling up dense but "drillable" materials such as cast iron, magnesium alloys, bronze and similar materials used in the Baker Cement Retainer and other drillable devices. ★ The Baker Junk Basket is positioned in the drilling string just above the bit. ★ Circulation fluid raises cuttings to the top of the basket, at which point the velocity is greatly reduced when it reaches the larger annulus (circulation area) due to the smaller diameter of the drill collar. ★ This sudden reduction in carrying (lifting) power of the circulation fluid causes the cuttings to drop into the basket where they are trapped. ★ See your BAKER (or Composite) CATALOG for details and specifications; or write to Baker Oil Tools, Inc., at Houston, Los Angeles, or New York.

BAKER JUNK BASKET

PRODUCT NO. 428

dense 8,925 ft., first bromide sand 9,395 ft., Oil Creek 9,895 ft., Joins 10,102 ft.

Okfuskee County: Woods Drilling 2 Crane, SE NE NE 8-13n-7e, dry, TD 2,123 ft., Oswego 2,695 ft., Prue 2,710 ft.

Ramsey Oils 1-B Hayden, NW NW NW 17-13n-10e, dry, TD 3,489 ft., sand 2,240 ft., lower Dutcher 2,690 ft., Wapanucka 2,892 ft., no Cromwell, Mississippi lime 3,167 ft., Sylvan 3,380 ft., Viola 3,427 ft., dense 3,452 ft., dolomite 3,458 ft., Wilcox 3,478 ft.

Seminole County: Sanders 1 Danielson, NE SE SW 23-9n-7e, dry, TD 3,572 ft., lower Wewoka 1,893 ft., Calvin 2,133 ft., coal 2,395 ft., Senora sand 2,492 ft., Earlsboro 2,770 ft., Inola 9,052 ft., lime 3,245 ft., Booch 3,357 ft., Gilcrease 3,413 ft., Gilcrease sand 3,440 ft.

Stephens County: Nichols-Duncan 1 Green, SE NE NW 8-1s-4w, dry, TD 6,953 ft., Springer 5,915 ft., Humphrey 6,310 ft., Simpson 6,590-6,650 ft., broken Simpson 6,683-6,875 ft.

Davis 2 McKinley, NE NW SW 34-2s-6w, dry, TD 2,577 ft.

Amerada 1 Tussy, NE NE NE 23-1n-4w, dry, TD 6,866 ft., Cisco 1,825 ft., Hoxbar 2,370 ft., lime 2,455 ft., dense 4,360 ft., Springer 5,294 ft.

Tillman County: Dodson 1 Hoover, SE SE NE 25-1n-18w, dry, TD 60 ft.

CANADIAN FIELDS

Wild Gasser Killed; Now Drilling Ahead

CALGARY.—Western Leaseholds, Ltd., of Calgary killed its wild gasser that had been flowing natural gas at an 8,000,000-cu. ft. daily rate for about 4 days. The well, Western-Redwater 21-6, LSD 6, 21-57-21w4, about ¼ mile from other Redwater oil wells, lost circulation in D2 zone of Devonian around 2,912 ft. Attempts to regain circulation were unsuccessful and the well blew wild, with gas flowing from the Viking and lower Cretaceous gas sands. The flow was stopped by pumping mud and sawdust down the hole under high pressure. The crew has continued the hole and is proceeding ahead for the main objective D3 zone of Devonian. Production is assured.

Halfway Lake.—The Pacific - Sunray 2, LSD 9, 35-59-23w4, about 12 miles northwest of Redwater field near Halfway Lake, has found the D2 zone of Devonian around 3,285 ft. and is continuing in that horizon at 3,626 ft. The D3 zone is expected within the next 15 to 20 ft. The well, located about 4½ miles northeast of the team's lower Cretaceous gas discovery, also found gas in the Cretaceous and in the D1 zone of Devonian.

The lower Cretaceous test, run around the 2,765-ft. level, gave an estimated natural gas flow rate exceeding 2,000,000 cu. ft. daily. The well was then carried down to the D1 Devonian zone, where drill-stem test from 3,014-25 ft. gave a pipe recovery of 500 ft. of gas-cut mud. Gas flow during the test was measured at 500,000 cu. ft. daily.

Normandville.—Imperial Oil's northernmost wildcat, Imperial-Normandville 1, has obtained encouragment but noncommercial showings of oil in limestone around 3,300 ft. A drill-stem test run during the past week gave about a 1,300-ft. rise of light oil, but an even greater rise of water from a thin porous zone. Since this test, further coring and testing has yielded only drilling mud and salt water. The well is currently proceeding ahead at 3,573 ft. It is located about 30 miles south of the town of Peace River and 215 miles northwest of Edmonton, in LSD 1, 16-79-22w5.

Castor.—Bailey-Castor 1, wildcat in LSD 13, 4-38-14w4, about 120 miles northeast of Calgary, has completed drilling at 4,700 ft. and is being plugged back for completion as a natural gas discovery in the Cretaceous. The well was carried down to the Devonian but failed to find oil production. However, Devonian reef material, believed to be equivalent to D3 Devonian pay zone at Leduc, Redwater, and Stettler, was encountered at 4,363 ft. Drilling was continued some 300 ft. in this porosity, but it was found to be water-bearing.

Stettler.—A drill-stem test run in the Viking sand horizon at the 1 Casagama, wildcat near Stettler, gave a natural gas flow rate estimated at more than 500,000 cu. ft. daily. The well, located in LSD 5, 7-39-19w4, on the 20-minute test, in addition to gas gave a fluid recovery of 120 ft. of drilling mud, with no formation water showing. Drilling is now proceeding below 3,800 ft.

Campbell.—Swabbing during the past week at the Redwater Leaseholds-Campbell 1, wildcat in LSD 1, 28-54-25w4, about 8 miles northwest of Edmonton, has given oil recovery amounting to around 30 bbl. daily. Gravity of the oil is 31°, with small percentage of water cut. Pump unit is now being installed, and the well will likely go on pump test in the next few days. The venture, completed in the Devonian at 5,008 ft., failed to find production in that formation, so was plugged back to the lower Cretaceous where oil showings had previously indicated production.

CANADIAN SUCCESSFUL WILDCAT

New Pacalta-Whitemud 1, LSD 9, 15-51-25w4, TD 4,071 ft., IP 312 bbl. per day.

CANADIAN WILDCAT FAILURES

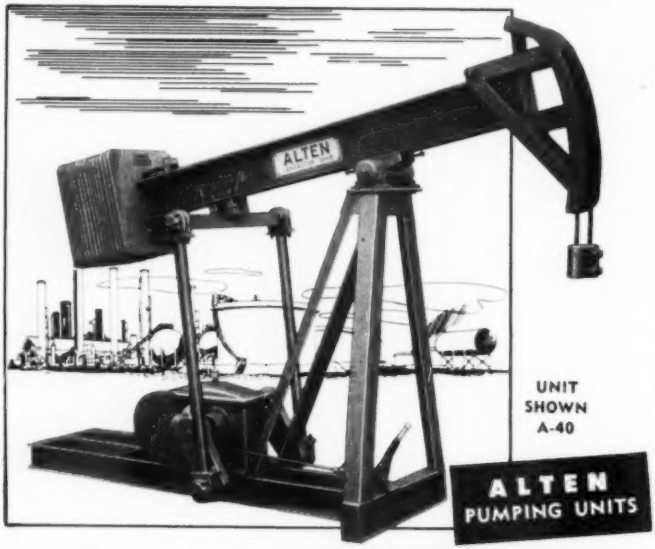
Socony-Craigmyle 2, LSD 9, 31-32-16w4, TD 4,104 ft.

Imperial-Golden Spike 3, LSD 3, 5-52-27w4, TD 6,700 ft.

Barnsdall-Honolulu - Seaboard-Smoky Lake 1, LSD 1, 35-59-18w4, TD 3,405 ft.

EASTERN CANADA

New Brunswick.—Shell Exploration New Brunswick, Ltd., will drill its third test



Check 'em for cost

By cost, we mean more than selling price. Compare Alten Units with any others—on economical production, upkeep, freedom from break-downs, long life. Many oil men who have made such cost comparisons rate Alten tops. Use them for money-saving operation.

Also Casing Heads, Stuffing Boxes, Stop Cocks and other production items.

A-40 FEATURES

★Rigid, all-welded steel Samson Post, Frame and Beam. Structural rating: 4,000 lbs.

★Quality Gear Reducer. Hardened alloy gears and pinions. Roller-bearing equipped. Double reduction ratio: 33.2:1. Torque rating: 17,500 in. lbs.

★Adjustable stroke length: 17" to 23".

★Wrist Pin and Equalizer has double-row, spherical, self-aligning roller bearings.

ALTENS
FOUNDRY & MACHINE WORKS, INC.
Lancaster, Ohio
Established 1889
Ask for Name of Nearest Dealer

near Dorchester, 8 miles from the nearest producer in Stoney Creek field, and 15 miles from the 11,500-ft. dry test drilled by Sun Oil Co. near Amherst, Nova Scotia. Two previous tests drilled last year by Shell Exploration in King's County were unsuccessful. The new location, on silts of the Memramcook River, will involve extensive work in road construction and building timber mats for the drilling equipment. The test will be the deepest ever drilled in New Brunswick.

Quebec.—In the Gaspe Peninsula, Quebec Oil Development, Ltd., has started work on roads and bridges preparatory to drilling its first test on the Power Joncas dome. Actual drilling is expected to start this fall.

Ontario.—In Elgin County, Ontario, Richfield Oil & Gas Co. has encountered an 18-ft. oil sand in its well on the Graham farm, Concession 4, Aldborough Township. Location is between the new Mosald gas field, developed by Union Gas Co., and the village of Rodney, and the sand was encountered in the Onondaga limestone, around 400 ft. This is the producing horizon in Petrolia and Bothwell shallow fields. Farther east, in Dunwich Township, a small oil pool in this horizon was opened more than 50 years ago. Richfield 2, McMillan farm, Concession 4, is nearing completion.

APPALACHIAN FIELD

West Virginia Gets Good Gas Wells

PITTSBURGH.—In Portland district, Preston County, West Virginia, Hope Natural Gas Co. 2-9331 J. Paul Martin, elevation 1,898 ft., was completed with gas gaging 2,071,000 cu. ft.; 24-hour rock pressure was 2,140 psi. in the chert and Oriskany; total depth was 5,360 ft. In Union district, Jackson County, this company's 9333 Luella Harrison tested 734,000 cu. ft. of gas in the brown shale. It was dry in the Oriskany sand at 4,271-98 ft.; total depth was 4,314 ft. In Elk district, Kanawha County, United Fuel Gas Co. 6480 C. J. Hunt was dry in the Oriskany sand at 5,330-90 ft., and bottomed at 5,403 ft. It was plugged back to produce from the Weir sand, testing 189,000 cu. ft. of gas. A good shallow sand gas well was brought in in Trap Hill district, Raleigh County, at Hope Natural Gas Co. 9359 J. H. Cook. The well gaged 2,623,000 cu. ft. of gas in the Princeton and Ravencliff sands; total depth was 1,684 ft.

In Wharton Township, Fayette County, southwestern Pennsylvania, William E. Snee et al 3 Indian Creek Coal & Coke Co. is drilling at 425 ft. The elevation of this well has been announced as 2,615 ft. In Napier Township, Bedford County, South Penn et al-Snee & Eberly 1 Jesse B. Miller, has resumed drilling and is now at a depth of 3,444 ft.

Oil Forms

Immediate delivery from stock of KRAFTBILT forms designed for every need in oil production record keeping. Fast service. Write for FREE catalogs.

Ross-Martin Co.

415 E. 4th Street
Tulsa 1, Okla.

WEST VIRGINIA SUCCESSFUL WILDCAT

Preston County, Portland district: Hope Natural Gas Co. 2-9331 J. Paul Martin, elev. 1,898 ft., 2,071,000 cu. ft. of gas, chert 4,900 ft., gas 4,926 ft. and 4,965 ft., Oriskany sand 5,172 ft., gas 5,179 ft., 5,195 ft., 5,283 ft., and 5,330 ft., rock pressure 2,140 psi., TD 5,360 ft.

ROCKY MOUNTAIN

Wildcat Runs Casing, Plans Devonian Test

DENVER.—British-American Oil Producing Co. is running casing on its Devonian wildcat in Teton County, Montana, with the well at 3,652 ft., total depth. The well is the 1 Swenson, SE NE SE 7-24n-2w, and scattered staining was logged in the Devonian. The company plans to acidize and test the venture thoroughly prior to completion. Top of Devonian green shale was logged at 2,860 ft., with Madison at 1,720 ft. The wildcat is considered of importance in a new campaign to test Devonian possibilities along the flank of the Sweetgrass Arch of northcentral Montana. British-American recovered 120 ft. of oil-cut mud on 1-hour drill-stem test of a thin sand section in the top of Devonian, above the present Jefferson lime section. General Petroleum Corp. is now drilling below 3,037 ft. in Madison at its 48-9-P, SE SE SW 9-26n-4w, in the Agawam area, 25 miles northwest of Acme. This well is also scheduled as a Devonian test. At least eight other wildcats are drilling with Devonian as objective in this northcentral Montana area, and a discovery at any of these wells would probably start an extensive lease play throughout the area.

Carter Oil Co. and Stanolind Oil & Gas Co. have shut in their discovery at 1 Ute Tribal, C NW SW 21-1s-1e, Roosevelt area, Uintah County, Utah, after the well flowed an average of 68 bbl. of oil per hour on 24-hour test this week. A total of 2,462 bbl. was recovered on the complete 35-hour test following a 1,000-gal. acid treatment. Production is from a basal Tertiary zone between 9,351-92 ft. and the oil is 31° gravity, brown, paraffin base. As a result of this discovery leasing has again become active in the western Uinta Basin, and it is reported other operators now plan wells. Phillips Petroleum Co., The California Co., General Petroleum Corp., The Texas Co., and others have sizable blocks in the area. As soon as tankage is installed at the Roosevelt discovery an extended test will be made of the well.

Continental Oil Co. established a new pay in Sussex field at its 4 Unit, NW SW NW 17-42n-78w, Johnson County, Wyoming, completing for an estimated 240 bbl. of 40°-gravity oil per day following swabbing tests. Production is from the Shannon sand between 4,530-6,917 ft. The well found water in the Lakota and was drilled to 7,867 ft. before the operator plugged back for completion in the Shannon. Shows in Wall Creek sands in the well were not productive. Continental made a Lakota sand discovery in this field in 1948, and now has three producing wells in the field. Recently the company made a discovery 3 miles southeast of previous production, but within the Sussex unit.

Ohio is now pumping an average of 230 bbl. of 35°-gravity green oil daily from its 1 M. E. Egging, NE NE NE 11-15n-49, Gurley area, Cheyenne County, Nebraska. Last week the well was making an average of 17 bbl. of oil hourly, but the pump was pulled and reset prior to the present testing. As a result of this discovery, it is reported from Sidney that there is active leasing throughout the entire northeastern side of the Denver Basin, and reports of additional drilling are numerous. Ohio is now drilling a 1,320-ft. north offset to the discovery and reportedly plans to move in additional tools in the area.

Amerada Petroleum Corp. is completing

CHAIN TONGS

"ARMSTRONG BROS." Chain Tongs come in "Standard", "Reversible Jaw" and "Ideal" (V-jaw) types—in sizes for every need. Their drop-forged jaws have milled teeth, are hardened, tempered and tested for wearing qualities. They have heavy forged-in lugs that give extra bearing on the handles to which they are rigidly held by a large hardened steel bolt. The handles are forged and heat treated to the correct balance of stiffness and spring. Shackles are drop forged and chains proof-tested to ½ catalog strength (3,600 lbs. to 40,000 lbs.)

Write for New S-48 Catalog, just released.

ARMSTRONG BROS. TOOL CO.
5204 West Armstrong Avenue
Chicago 30, Illinois
New York
and
San Francisco

Martin

screw-lift GATE...

A low cost, low-pressure, center wedge, full-opening gate with non-rising screw. Used by oil companies for dewatering sedimentation basins and for other drainage purposes. Cast-iron body with iron or bronze seat in 6" to 24" sizes. Built for hard work, easy operation and minimum maintenance. Write for Type "W" Bulletin and prices.

Martin
IRON WORKS
P.O. Box 2857—Terminal Annex
Los Angeles 54, Calif.
Since 1900

Plant and General Offices, 1222 E. 28th Street

PENBERTHY
"ALL IRON"
LIQUID LEVEL GAGES

Body made from a special high strength alloy iron, shanks alloy steel and trim stainless steel. Extra heavy construction throughout, automatic and positive shut-off if glass breaks, heavy duty stuffing boxes. Conform with A.P.I.—A.S.M.E. requirements.

The "All Iron" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

PELCO
Welding Saddles

Specify
PELCO

Immediate Delivery

OUTLET (OR NOZZLE)
SIZES ¼" to 16"

HEADER (OR LINE)
SIZES UP TO 36"

ORDER THROUGH YOUR
FAVORITE SUPPLY HOUSE

PELICAN WELL TOOL
& SUPPLY CO.
P. O. Drawer 1108 Shreveport (84), La.

a small discovery in the Sage Spring Creek area, at 1 Unit, C SW SE 30-37n-77w, Natrona County, Wyoming, with the well making 4 bbl. of oil per hour, swabbing, from the Dakota sand. Top of Dakota was found at 7,247 ft., with plugged back depth 7,272 ft. The Dakota was shot prior to completion. The oil is 35° gravity, light, paraffin base. This well was drilled into Madison at 9,404 ft., total depth, prior to plugging back for completion. Location has been made for the second well on the unit, ½ mile northeast of the discovery, in the C SE NE 30-37n-77w. This new field is located between Cole Creek and Teapot Dome fields on the southwest side of the Powder River Basin.

WYOMING SUCCESSFUL WILDCAT

Little Buck Creek, Niobrara County: Continental Oil Co. 14 E.L.C.U. "B" (10 Bowman), NE NE SE 26-36n-65w, TD 6,531 ft., PB 6,148 ft., estimated potential 450 bbl. oil per day, 7-in. casing at 6,136 ft., Dakota 3,809 ft., red beds 4,630 ft., Converse 5,227 ft., first Leo 5,746 ft., third Leo 6,020 ft., Belle San 6,299 ft., Madison 6,426 ft.

MONTANA WILDCAT FAILURES

Cassady Structure, Hill County: Midwest Drilling 1 Schnitzmeyer, SE SW NE 14-35n-16e, TD 2,020 ft., suspended indefinitely, Eagle 1,370 ft.

Devils Basin, Musselshell County: Cloverleaf Co. 1 NPRR, SE SE SE 23-11n-24e, TD 1,248 ft., suspended indefinitely.

Cloverleaf Co. 1 Morton, NE NE NE 26-11n-24e, TD 1,139 ft., suspended indefinitely.

Gypsy field, Pondera County: K. C. Morton 1 Northwestern Bank, C SW NE 33-28n-6w, TD 3,111 ft., suspended indefinitely, Sunburst 2,715 ft., Ellis 2,850 ft., Madison 3,065 ft.

LA.-ARK.

Oil Shows Rumored In "Tight" Hole

SHREVEPORT.—McAlester Fuel Co. 1-A Waller estate, 27-18n-13, "tight" wildcat drilling 1 mile east of Bossier City, in Bossier Parish, was unofficially reported to have recovered some oil-cut mud on a drill-stem test at 5,540-56 ft., when the tool was opened 1 minute. It was reported drilling ahead below 5,557 ft., in the Sligo.

Caldwell Parish.—Sohio Petroleum Co. 1-C LaSalle Land Co., SE NW 27-13n-5e, was drilling below 5,080 ft. in the lower Cretaceous, after taking side-wall cores in the Wilcox. Top on the Midway was logged at 3,600 ft.

Catahoula Parish.—H. J. Strief 1 W. S. Peck, irregular Section 41-10n-8e, was drilling in the upper Cretaceous at 7,277 ft. Electric log top on the Wilcox was 3,136 ft.

DeSoto Parish.—Carnes, Halbouty & Blalock 1 W. C. Nabors, 21-12n-12w, a new Travis Peak wildcat 2 miles south of Naborton, was drilling ahead below 4,110 ft. Tops logged were: base annona 1,505 ft., Buckrange 1,640 ft., base Austin 2,506 ft., Paluxy 2,595 ft., Glen Rose 3,773 ft., Elevation was 341 ft.

LaSalle Parish.—Justiss-Mears Oil Co. 1 J. E. Harris, NW NW 2-6n-3e, swabbed salt water with a good show of oil, from perforations at 3,998-4,010 ft. in the Wilcox, then squeezed and was waiting on cement.

Natchitoches Parish.—Continental Oil Co. 1 Bastrop State Bank, 18-10n-6w, was drilling at 7,071 ft., in the massive anhydrite.

Tensas Parish.—Union Oil Co. of California 1 Weatherly-Anderson, SE SW 38-12n-12e, was drilling Cretaceous material at 6,570 ft. Side-wall cores in the Wilcox, topped at 4,237 ft., had no shows.

NORTH LOUISIANA WILDCAT FAILURES

Union Parish: Gus Primos Oil Co. 1 O. L. Tugwell, 21-22n-1e, dry, TD 2,700 ft.

J. B. Taylor 1 J. B. Denton, SE SE NE 13-21n-1w, dry, TD 2,403 ft.

ARKANSAS WILDCAT FAILURE

Union County: Carter Oil Co. 1 T. F. Russell, SW NW 33-17s-16w, dry, TD 8,375 ft. in salt, PB 6,430 ft., Midway 1,382 ft., Arkadelphia 1,968 ft., Nacatoch 2,070 ft., sand 2,134 ft., Tokio 2,932 ft., James 3,435 ft., Travis Peak 3,780 ft., Cotton Valley 5,135 ft., Buckner 7,295 ft., Smackover 7,330 ft., porosity and salt water 7,345 ft., elev. 240 ft.

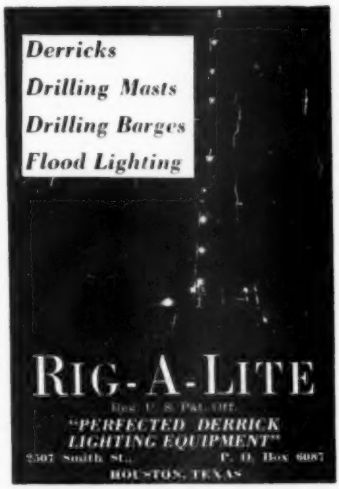
MISSISSIPPI

Jefferson County Wildcat Cores Shows and Porosity

JACKSON.—Stanolind Oil & Gas Co. 1 J. B. Dockery, irregular section 17-10n-2e, Jefferson County, wildcat 2 miles south of Russum, has cored oil shows in the lower Tuscaloosa. At 9,725-30 ft., recovery was 4 ft. of oil-stained sand. Another core at 9,730-32 ft. recovered 3 in. of hard, tight sand with no shows and 1 ft. of soft sand with condensate odor. Third core at 9,769-74 ft. recovered 3 ft. of slight to fairly porous sand with oil stain and odor.

Walter E. Sistrunk has been granted permit to drill 1 J. A. West in NW SE 13-9n-8w, Yellow Creek field, Wayne County, Miss.

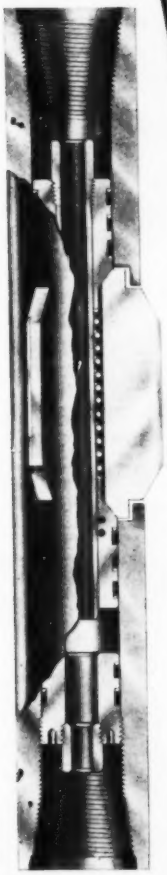
Big Chief Drilling Co.-W. B. Osborn 1



CONTROL ALGAE AND SLIME
Paddock CHLORINATORS

Operates on high vacuum . . . no moving parts. 8 capacity ranges — 15 lbs. to 2000 lbs. of chlorine per 24 hours. Also ideal for chlorinating drinking water.

Paddock Sales of Texas
Sales Agent for Paddock Engineering Company of Texas
3727 Atwell St. Dallas 9, Texas • M & M Bldg., Houston 2, Texas



One of the easiest and most effective ways you can safeguard well completion work is to run a Grant Casing Scraper above the bit when drilling out cement! This efficient tool — under full control of the operator at all times — completely removes cement, mud and other foreign material from the casing wall . . . smooths off burrs made by gun perforating . . . paves the way for free, unobstructed passage of pipe and tools . . . insures positive slip engagement of packers and other production equipment. *It's not only a valuable tool for new well completion, but also for use on work-over jobs during the producing life of the well!*

OPERATED BY PUMP PRESSURE

When running in the hole, the blades remain retracted and are expanded by simply applying mud pump pressure whenever scraping is to begin. Thus, the blades do not ride the casing going into the hole, eliminating blade wear and insuring full scraping efficiency. Blades retract easily on removal of pump pressure. Moreover, any degree of scraping pressure can be obtained by simply adjusting pump pressure, providing proper scraping action for any operation. Pump pressure adjustment is not critical, the tool operating properly over a wide pressure range. The Grant Casing Scraper can also be adapted to run safely on tubing.

Grant Casing Scraper bodies are machined from alloy steel, heat treated for strength and long wearing life. Scraping blades — securely locked in the body to prevent loss — are made of carbon steel, hard-faced for full cutting efficiency.

For safer, easier, more economical completion and workover jobs, get full details on the Grant Hydraulic Expansion Casing Scraper from the Grant representative in your territory. Send for Bulletin No. 17 giving body sizes, scraping ranges and complete descriptive information.

Proven GRANT Tools
Used Where Performance Counts

Hydrostatic Bailers	Bulletin No. 11
Liner Pullers	Bulletin No. 14
Pressure Releases	Bulletin No. 15
Casing Scrapers	Bulletin No. 17
Wall Scrapers	Bulletin No. 20
Bottom Hole Scrapers	Bulletin No. 21
Underreamers (Rotary)	Bulletin No. 24
Underreamers (Cable Tool)	Bulletin No. 27
Hole Enlargers	Bulletin No. 38
Reamers	Bulletin No. 43
Hydrostatic Perforation Cleaners	Bulletin No. 50
Dump Bailers	Bulletin No. 51
Roller Cutter Shale Bits	Bulletin No. 54
Sand Pumps	Bulletin No. 55
Impression Block Tool	Bulletin No. 56
Well Cleanout Equipment	Bulletin No. 57

Write for Descriptive Bulletins on these GRANT Tools

GRANT OIL TOOL COMPANY

Main Office and Plant: 2042 East Vernon, Los Angeles 11, California

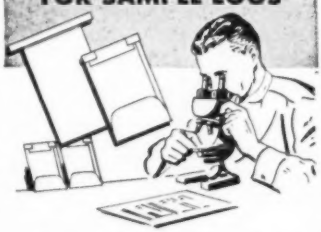
Branches at Bakersfield, Avenal and Ventura, California, and at Odessa and Houston, Texas

PENBERTHY
EJECTORS

Use the power of steam, air or water under pressure to lift liquids. Being simple jet pumps they have no moving parts and require no lubrication. A variety of models to meet different conditions. Also used as water heaters.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

METAL FLAP ENVELOPES
FOR SAMPLE LOGS



It cost money to collect those samples...they are worth protecting. Tension Metal Flap Envelopes resist wear, assure long, safe storage...runs and re-runs. Their rustproof bar and waterproof gum give years of service and protection. For samples write

TENSION ENVELOPES
TRADE MARK REGISTERED

TENSION ENVELOPE CORP.
Kansas City 8, Mo.
19th & Campbell HArrison 0092

George Zeigler, NW NW 2-6n-7e, Lincoln County, recovered 2 ft. of oily core on test at 10,552-58 ft. Another core at 10,583-90 ft. recovered 6 ft. with no show. Operators are coring ahead.

Two field wells and two wildcats were completed in Mississippi during the week and no completions were recorded for Alabama, Florida, or Georgia. Alabama currently has four active wildcats and no field wells. There are three active wildcats and one field well in Florida, and one wildcat in Georgia.

MISSISSIPPI WILDCAT FAILURES

Adams County: Kemp Drilling Co. 1 Armstrong, 3-5n-2w, dry, TD 6,615 ft.

Wilkinson County: American Republics Corp. 1 Crosby Lumber & Manufacturing Co., SW NE NW 31-4n-2w, dry, TD 11,783 ft.

TEXAS GULF COAST

Refugio County Test Logs Oil Shows

HOUSTON.—Southern Minerals Corp. 1 J. C. West, wildcat north of Refugio, Refugio County, has logged several shows in drilling to 5,960 ft. At 5,585-91 ft., a 12-minute drill-stem test through ¼-in. chokes developed 530 psi. working pressure and recovered 10 ft. of condensate and 20 ft. of water. Light shows of oil were tested at 5,441-50 ft. and 5,803-23 ft. Well is 1½ miles northwest of the company's gas-condensate discovery, the 1 Perryman.

Sinclair Oil & Gas Co. 1 C. W. Schneider, located on a 177-acre lease in the B. J. Ijams Survey, Colorado County, Glasscock field, is testing gas and condensate from the Wilcox. Total depth is 9,613 ft., and pipe is perforated from 9,465-70 ft.

H. R. Smith, Rodney DeLange and W. E. Fox 1 J. S. Carriger, is a wildcat scheduled to be drilled to 6,500 ft. on a 420-acre lease in Don Casper Flores Grant, 7 miles northeast of Fashing, west corner of Karnes County. Humble Oil & Refining Co. and Southern Minerals Corp. have nearby acreage.

On a potential test, Stanolind Oil & Gas Co.'s confirmation well to the Hartburg discovery in Newton County, flowed 77 bbl. of 41°-gravity oil. Test was through perforations at 7,554-58 ft., using ⅛-in. choke, and the well flowed 50 per cent water with tubing flowing pressure of 1,800 psi. The venture is 1 C. A. Morgan in W. B. Ellis Survey. Total depth is 7,500 ft. and 7-in. pipe was cemented to 7,612 ft.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Chambers County: Humble Oil & Refining Co. 12 M. E. Mayes, gas-condensate discovery, East Mayes area, Solomon Brill Sur. A-55, 8 bbl. condensate and 82,000 cu. ft. of gas daily, ½-in. choke, GOR 16,750, TP 2,200 psi., 60.8° gravity, TD 9,500 ft.

Lavaca County: Grubb & Hawkins 1 E. P. Zock Trustee et al, new pay and extension, ungaged gas well, 1½ mi. SW Grub & Hawkins 1 Clark gas discovery, Speaks field, 13 miles southeast of Hallettsville, TD 2,149 ft., TP 700 psi.

Live Oak County: Henderson Coquat 1 W. W. & Sophia Goebel, Block 4, Charles R. Tips Subdivision, Willworth Ranch, 50 bbl. daily, 12/64-in. choke, GOR 5,778, TP 560 psi., 43° gravity, TD 7,150 ft.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Chambers County: Abercrombie & Halbout 1 Kilgore, John Ijams Sur. A-15, 3 mi. SW Goose Creek, dry, TD 7,300 ft.

Gonzales County: Southern Minerals Corp. 1 Smith, J. R. Hubert Sur. A-268, 6 mi. SE Smiley, dry, TD 6,615 ft.

Jefferson County: Crown Central Petroleum Corp. 1 French est., H. P. Savery Sur., 6 mi. NW Beaumont, dry, TD 8,016 ft.

Montgomery County: Coast Co. 1 Pitts & Lyles, T. J. Stansbury League, 4½ mi. N Tomball, dry, TD 7,000 ft.

Polk County: Hawkeye Petroleum Corp. 1 G. C. Flannery, A. Viesca League, 9 mi. SE Livingston, dry, TD 7,151 ft.

SOUTH LOUISIANA

East Longville Field Gets Good Oil Well

NEW ORLEANS.—A second well has been completed by Barnsdall Oil Co. in the East Longville area of Beauregard Parish, the third oiler for the field. The company's 1-C Long Bell Lumber Co., 2-6s-9w, is an east offset to the 1 M. Jones, discovery well. Total depth was 8,749 ft. and perforations were made at 8,304-16 ft. On 10/64-in. choke, the well flowed naturally at rate of 262 bbl. of 47.6°-gravity oil daily with tubing pressure of 1,500 psi.

Superior Oil Co. B-1 State Lease 1164, wildcat 25 miles off Cameron Parish in the

Over thirty years of practical experience is back of Dragon Cups.

•

GET THEM AT YOUR SUPPLY STORE

DRAGON MFG. CO.
Marietta, Ohio

BARRET

SPECIALIZING IN MAGNETIC SURVEYS

Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique.

William M. Barret, Inc.
Consulting Geophysicists
GIDDENS LANE BUILDING
SHREVEPORT, LOUISIANA

Gulf of Mexico, has cored gas sands from 7,148-95 ft. It is projected to 12,000 ft.

Hawkins & Jayred 1 Edmond Young, semiwildcat west of West Tepetate production in Acadia Parish, flowed 10 bbl. of condensate and a heavy volume of gas on initial test. The well is located in 31-7s-2w. Total depth is 9,165 ft. Tests were made through perforations at 9,929-41 ft and through a 1/8-in. choke. Tubing pressure while flowing was 2,000 psi.

Atlantic Refining Co. has run pipe to test deep sands below 9,500 ft. in its 1 Stokes Unit, SW 10-2s-2e, southwest flank well at Dave Haas field, Avoyelles Parish. Total depth is 11,200 ft.

N. CENTRAL TEXAS

Taylor County Test Hits in Strawn

WICHITA FALLS.—Completion of a Taylor County discovery and drilling on an offset test were scheduled this week. The Strawn discovery is J. P. Production 1 N. V. Atwood, J. T. Thompson Survey, 2½ miles southwest of the town of Lawn, in the southeast corner of the county. Completion of the well was delayed by collapse of pipe after shooting. Operators were swedging out the pipe and the well was reported to be making about 30 bbl. of oil a day during the operation. Total depth was 4,121 ft., with casing set to 4,103 ft.

Outpost test to the new well was Hiawatha Oil & Gas Co. 1 R. E. Carter, located 330 ft. from north and east lines of the center ½ of the north half of Section 433, J. C. Thompson Survey. It is a west offset. Drilling was to start immediately on a 4,500-ft. contract.

In western Taylor County, Star Oil Co. 2 W. L. Ray, 2,457 ft. from north and 660 ft. from east lines, Section 422-64-H&TC, was ready to drill ahead to test the reef limestone. Location is 4½ miles northwest of the town of Shep, and south of the same operator's 1 Ray, drilled earlier this year, which had a show of oil in the reef near 4,300 ft.

Fisher County.—Mid-Continent Petroleum Corp. 1-A Menko Leeper, 186-3-H&TC, 9 miles southwest of Roby, ran a 1-hour drill-stem test in the Ellenburger from 6,910-7,001 ft., total depth. Recovery was 10 ft. of drilling water, 30 ft. of drilling mud, 720 ft. of sulfur water slightly cut with gas.

Montague County.—Drilling throughout the county was reported on the upturn this week. On the south side of Lewis-Stuart field, Konrad Sztykgold 1 Mrs. A. T. Adkins, A. Campbell Survey, extended production ½ mile. The well topped the lower conglomerate at 6,367 ft. and drilled to 6,384 ft. A drill-stem test of the interval, open 11 minutes, had gas in 5 minutes and flowing oil in 10 minutes. The pipe unloaded oil when broken down. Recovery was 800 ft. of free oil and 400 ft. of heavily saturated oil-cut mud. After running electrical surveys, 5½-in. casing was set at 6,442 ft., and jet-perforated with 19 shots from 6,372-77 ft. After shooting, the well kicked off and flowed an unestimated amount of oil into pits. Production was turned into tanks but was not gaged at last report. The well was expected to add considerable drilling to the area.

Southwest of Nocona, C. U. Bay 2 Roy O. Cole, Block 69, J. H. Belcher Survey, which previously showed for a southwest extension to Stansell Bend conglomerate field when it recovered 200 ft. of oil on a test at 5,393-5,412 ft., recovered 200 ft. of salt water on a 1-hour test at 5,697-5,707 ft. Bottom-hole pressure on the last test was 1,050 psi. in 15 minutes.

Northwest of Bowie, Stanolind Oil & Gas Co. 1 Louise Barker, Section 12, Limestone CSL, had an oil sand at 4,718 ft., but a drill-stem test from 4,719-35 ft., open 30 minutes, recovered 20 ft. of drilling mud with no shows. It continued drilling below 5,000 ft.

New work included Bluff Creek Oil Co. and L. R. Whittson 1 Tony Fenoglio, 6,500-ft. test located 467 ft. northeast of the Minor discovery, in the C. C. Milne Survey, A-485. It will be drilled with an electric rotary.

Bay Petroleum Corp. had rig moved in at its 1 D. C. Gregory, 6,650-ft. test located 660 ft. out of the southeast and northwest lines, W. S. Payne Survey, 5 miles southeast of Montague.

Location was staked for a semiwildcat at L. W. Barrett 1 J. P. Hogan, J. F. Trimer Survey, A-139, 1 mile southeast of Mallard. Contract depth was 6,500 ft., with rotary. Location is about ½ mile east of Continental Oil Co. 1 Williams.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCAT

Jack County: Russell Maguire 1 R. E. Kelsey, B. B. Straughn Sur., A-532, 6 mi. N Perrin, flowed 235 bbl. 43°-degree gravity oil a day, Caddo 4,566-80 ft., TD, 16/64-in. choke, CP 700 psi., TP 200 psi., elev. 1,250 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: Fain & McGaha 1 Albert Holzer, Louis Lapoleon Sur., 6 mi. SE Wichita Falls, dry, TD 5,380 ft., tops not reported.

W. G. Gouchie 1 E. A. Hoff, Lot 38, Blk. 5, Clark & Plumb Subd., 4 mi. E Archer City, dry, TD 1,132 ft., sand with light odor 809-32 ft.

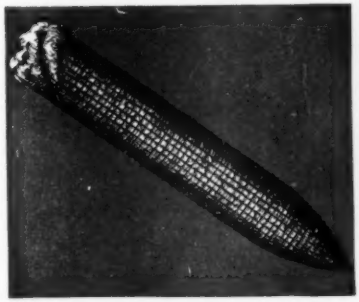
R. O. Wood 2 Parish, SPRR Sur., 7 mi. S Wichita Falls, dry, TD 4,017 ft.

Brown County: G. W. Graham 1 Bona Vista Hooks, 91-13-T&P, 7 mi. N Clyde, dry, TD 2,041 ft.

Clay County: R. Clay Underwood 1 Gus Blakely, Blk. 79, Freestone CSL, 10 mi. S Bellevue, dry, TD 2,465 ft.

Coleman County: L. H. Armer 1 Sealy-Smith Found., 1½ mi. NE Valera, dry, TD 3,662 ft., show of gas 2,581-90 ft. on DST, Ellenburger 3,600 ft.

E. K. & E. M. Burt 1 G. E. Kemp, Sec. 313, G. W. Hatchett Sur., 3 mi. SW



Don't risk Bottom Water shutdowns

Eagle-Picher Lead Wool

shuts out Bottom Water!

Prevent costly shutdowns, keep bottom water out of your wells with effective, economical Eagle-Picher Lead Wool. The fine, durable strands fill cracks and crevices with a permanent, non-corrosive seal...save you time and money. Packed in convenient 50-pound sacks — easy to place in special cartridge-shaped Eagle-Picher Wire Containers sized to fit all casings. Order through your jobber today!

These 3 Eagle-Picher Bearing Metals meet most requirements

Dreadnaught — for extreme speed and heavy-duty conditions.

Outlasta — for medium speed and average-load conditions.

Durable—for low speed and light-duty conditions.

EAGLE-PICHER LEAD WOOL

Seals off Bottom Water— keeps 'em flowing!

THE EAGLE-PICHER COMPANY

EAGLE Since ED PICHER 1843

Cincinnati • East St. Louis
Chicago • Dallas • Kansas City

a life saver

Thousands and thousands of "drowning" wells have literally been "saved" by the BAKER Model "K" CEMENT RETAINER, Product No. 400. It is so successful for special and remedial cementing that experienced oil operators in every field in the world use it as "standard equipment." Here are some of the applications where the Baker Cement Retainer can prove to be a "life saver" for you . . . Squeeze Jobs • Recementing • Reducing Gas/Oil Ratios • Cementing Behind Sections of Pipe • Plugging Off Bottom Fluids • Testing Upper Cased Formations • Plugging Back to Upper Zones • Cementing Off to Perforate for Production • Cementing Bad Pipe • Used as a Casing Bridge Plug, with cast iron construction for *permanent* installations, and of magnesium alloy for *temporary* use. For complete details see your BAKER (or Composite CATALOG, or write to Baker Oil Tools, Inc., Houston, Los Angeles, or New York.

BAKER CEMENT RETAINER • *Product No. 400*

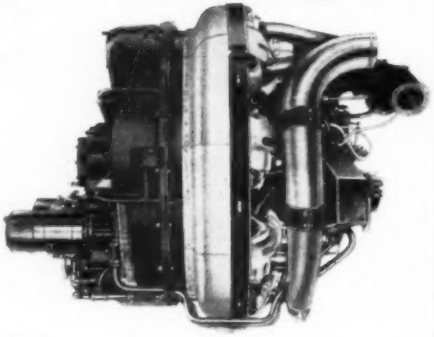
WAR SURPLUS!

450 H. P. Caterpillar Diesel Engine

Model RD-1820

At a fraction of original government cost!

- **9 cylinders, radial**
- **Air cooled**
- **Supercharged**
- **Twin disc clutch**
- **2000 R.P.M. governed speed**
- **Two Leece-Neville electric starters (32 volts)**
- **Woodward governor**
- **Integral fan**
- **5740 lbs. ship. wt.**



Designed for use on M-4A6 tank!

29 AVAILABLE . . . . . $3500.00 EA.
F.O.B. Kewanee, Ill.

MILT GROBAN 1507 S. Michigan Ave., Tel.: WEbster 9-4913
CHICAGO 5, ILL.

Glencove, dry, TD 4,340 ft., Palo Pinto 3,050 ft., Capps 3,335 ft., Gardner 3,645 ft., Gray 3,720 ft., Caddo 3,910 ft., Ellenburger 4,260 ft., elev. 2,054 ft.

T. A. Kirk 1 Mrs. E. M. Morton, Sec. 13, J. H. Gibson Sur., 7 mi. NW Coleman, dry, TD 3,796 ft.

Comanche County: Crader Oil Co. 2 H. E. & M. R. Shelton, Sec. 50, D&DA Sur., ½ mi. S Sipe Springs, dry, TD 2,750 ft., Marble Falls 2,548 ft., elev. 1,405 ft.

Coryell County: Joe Thompson, H. S. Woods and J. F. Fulwood 1 E. F. Lanhan, T Merrill Sur., 2 mi. E Gatesville, dry, TD 660 ft. in sand.

Jones County: Cen-Tex Petroleum Corp. 1 J. W. Scott, 5-2-T&NO, 7 mi. W Nugent, dry, TD 2,991 ft., Dotham 1,758 ft., Flippen 2,134 ft.

Grisham-Hunter Corp. 1 J. J. Steele, Blk. 39, League 334, Harrison CSL, 8 mi. W Anson, dry, TD 5,224 ft., Cook 2,675 ft., Hope 2,790 ft., Gunsight 2,880 ft., Swastika 3,020 ft.

Needl & Hood Drilling Co. 1 J. C. Culbertson, Sec. 6, GH&H Sur., 5 mi. NE Hamlin, dry, TD 3,265 ft., Dotham 2,341 ft., coal 2,722 ft., Flippen 2,735 ft., Gunsight 3,080 ft., Swastika 3,245 ft.

S. B. Roberts 1 J. I. Milsap, Harrison CSL 333, 8½ mi. W Anson, dry, TD 3,411 ft., Flippen 2,742 ft.

Montague County: George S. Engle 1 E. S. Howard, G. M. Coursey Sur., 10 mi. NE Nocona, dry, TD 2,300 ft.

Nolan County: J. H. Brodie and Sojourner Drilling Co. 1 J. W. Withers, 65-21-T&P, 3½ mi. SE Sweetwater, dry, TD 4,504 ft., Noodle Creek 3,410 ft., reef lime 3,950 ft.

Shackelford County: Intex Oil Co. 1 Elliott, Sec. 19, LAL Sur., 9 mi. S Albany, dry, TD 4,339 ft., top Caddo 3,693 ft., DST 4,281-4,309 ft., open 1 hr., recovered 1,175 ft. of oil and no water.

Taylor County: L. M. Lockhart 1 J. L. Camp, Sec. 44, SPRR Sur., 2 mi. SE Buffalo Gap, dry, TD 5,103 ft., Flippen 2,320 ft., Swastika 2,663 ft., Palo Pinto 3,857 ft., Ellenburger 4,935 ft.

Young County: McMahon-Bullington Co. 1 C. J. Tack, Sec. 285, TE&L Sur., 2½ mi. SW Jean, dry, TD 3,632 ft., sand with oil show 2,877 ft.

E. H. Remington 1 E. H. Remington, W. R. Peveler Sur., 1 mi. W Newcastle, dry, TD 452 ft., Gunsight lime 410 ft.

Willis Drilling Co. 1 Fawks est., J. F. Newby Sur., 3 mi. SE Bunger, dry, TD 2,602 ft.

Woods Drilling Co. 1 Hazel Shanafelt "C," A. Clingburg Sur., 3 mi. NE Loving, dry, TD 5,633 ft., Caddo 4,390 ft., conglomerate 4,607 ft.

CALIFORNIA

South Cuyama Deep Test Fails to Get Production

LOS ANGELES—Richfield Oil Corp.'s 1 Perkins has been abandoned at 11,883 ft. Located in 27-10n-26w, in the southeast end of the Cuyama Valley, the well was planned for a complete formation test of the South Cuyama area. There have been extensive coring and tests at the venture, but no commercial shows were found.

In the same area, the corporation's 22-36 Hibbard, 36-10n-27w, ran into water troubles but operator has now obtained satisfactory shut off and is drilling below 4,550 ft.

General Petroleum's wildcat, the 1 Circle J, 26-4n-16w, north of Newhall, has run casing to 5,750 ft. after reaming. Bottom is now at 5,850 ft. and water shut off is being tested.

A possible extension to Paloma field is Humble Oil & Refining Co.'s 54-9 KCL. The well has reached 9,700 ft. and geologic reports show formation checks with Paloma wells. The producing zone is expected around 10,500 ft.

A second Elkhorn Valley test is planned in Section 4-32s-22e, near Fellows, Kern County. The well will be drilled by Conti-

nental Oil Co. and known as the 1 U. S. Lease M. About 5 miles to the south, Frank Short's wildcat, the 2 Melinda, ran formation test at 1,578-1,650 ft. but recovered only mud.

In Wasco field, Kern County, Standard Oil's 5 Mushrush, has reached 15,866 ft., with 6⅝-in. casing cemented at 13,053 ft. At present, the well is being reamed.

Shell Oil's 37-4 KCL-A is drilling at 9,255 ft. The well is located 4 miles north of Cole's Levee near Canal field, in 4-30s-25e.

A possible northern extension of Corning gas field, Tehama County, was spudded in recently. It is the 1 Corning Community in the Flournay area, and is being drilled by Buttes Oilfields, Inc. Depth at last report was just over 500 ft.

In Washington, Union Oil 3 State has set 10¾-in. casing at 3,775 ft., and continues to drill and core below 6,257 ft.

CALIFORNIA SUCCESSFUL WILDCAT

Kern County, Edison area: Havenstrite, San Joaquin Drilling Co. and Rawn 1 Bowles, NW 35-30s-29e, pumped 200 bbl. of 31.7°-gravity oil per day, 0.03 per cent cut, TD 3,728 ft., elev. 359 ft., about 4 mi. SE Edison field production.

CALIFORNIA WILDCAT FAILURES

Kern County, Blackwell's Corner area: British-American Oil Producing Co. 58-8 Beer "B," 8-26s-19e, dry, TD 3,175 ft., elev. 638 ft.

Race Track Hills area: D. D. and Dorothy Dunlap 16-2 Palmateer, 2-30s-29e, dry, TD 5,219 ft., top gray Vedder 4,965 ft., top Pyramid Hills 5,062 ft.

Tejon Hills area: Stansbury, Inc. 1, 31-11n-18w, dry, TD 1,152 ft., elev. 837 ft.

Orange County, Tustin area: Amerada Petroleum Corp. 63-1 Irvine, 27-5s-9w, dry, TD 3,920 ft., elev. 65 ft.

Meadowlark area: Shell Oil Co. 5-22 Kettler, 22-5s-11w, dry, TD 9,261 ft., elev. 17 ft.

Santa Barbara County, Cuyama Valley area: Richfield Oil Corp. 1 F. K. Perkins, 27-10n-26w, dry, TD 11,883 ft., elev. 2,349 ft.

San Luis Obispo County, Cholame area: Continental Oil Co. 1 Taylor, 23-25s-15e, dry, TD 6,559 ft., elev. 1,730 ft.

Cuyama Valley area: R. B. Watkins 14-13 Wood-Callahan, 13-11n-28w, dry, TD 4,098 ft., elev. 2,290 ft.

Sonoma County, Petaluma area: V. O. Porter 1-1 Bettinell, 32-5n-6w, dry, TD 1,585 ft., elev. 153 ft.

PENBERTHY
AUTOMATIC
INJECTORS

The accepted method for assuring an uninterrupted supply of feed water to oil field boilers. Penberthy Automatic Injectors will supply feed water to boilers at minimum cost, are quickly and easily installed, reliable under most severe operating conditions, require little attention and no careful handling. Highest quality design and rugged construction.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

OHIO, KENTUCKY

Gas Well Extends West Litchfield Pool

COLUMBUS.—West Litchfield pool, Medina County, produced another large open-flow well for an east extension. The Ohio Fuel Gas 1 N. D. Yost, Lot 12, Litchfield Township, logged the upper Clinton at 2,661-69 ft. with a natural gage of 4,160,000 cu. ft. of gas. W. Hoey's 2 P. T. Webster in Harrisville Township, was drilled to 2,742 ft. and shot. The shut-in gage showed 3,610,000 cu. ft. of gas with a rock pressure of 1,030 psi.

In the Perryton extension, Allen Willey 2 J. Ridgeway, Section 8, Jackson Township, Muskingum County, was drilled through the Clinton at 3,140-97 ft. with a hole full of oil natural. After shot, the well made 126 bbl. in 24 hours.

The new gas pool, west of the city of Wellington, was extended ⅛ mile by G. B. Harmon et al 2 John Glavich, Lot 39, Wellington Township, Lorain County. The Clinton at 2,224-32 ft. made 280,000 cu. ft. of gas natural and 450,000 cu. ft. 1 hour after shot. Dodsley et al, 1 Ralph Lehman, city of Elyria, showed 519,000 cu. ft. of gas natural and an estimated 900,000 cu. ft. after shot from Clinton at 2,335-52 ft.

EASTERN KENTUCKY

ASHLAND.—In northwestern Lawrence County, 1-T-80, Compton & Long are about ready to abandon their 1 Wilson heirs, a rank wildcat test for the eastern Kentucky region. Designed to test the Corniferous and Big Six formations, the well topped the former formation at 2,218 ft. and the latter at 2,703 ft. with no showings in either. Total depth is now 2,770 ft. with the well shut down for orders.

One mile west of production in Indian Creek pool, southern Menifee County, A. H. Carpenter has recently drilled and abandoned four test wells on the large Shelby Palmer lease. Only slight shows of oil were had in the Corniferous lime followed by water. The wells averaged 550 ft. in depth.

The first new oil production for Breathitt County in some time has recently been discovered near the town of Van Cleve in the northwestern part of the county. Caputo & Epperson 1 Burl Cundiff, 16-N-74, have estimated 15 bbl. oil per day from Corniferous lime at a total depth of 1,528 ft. Three rigs are now drilling in the area. This new production lies about 2 miles east of Wilhurst field.

EASTERN KENTUCKY WILDCAT FAILURE

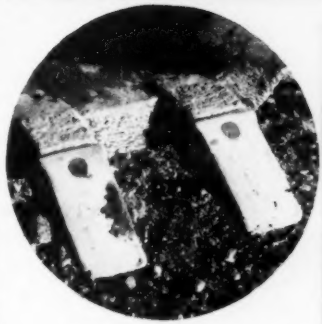
Menifee County: A. H. Carpenter 1 Shelby Palmer, Middle Fork of Indian Creek, dry, TD 572 ft., Devonian shale 370 ft., Corniferous 553 ft., rainbow show of oil, water.

WESTERN KENTUCKY

OWENSBORO.—A mile southwest of the Morganfield pool in Union County, Sun Oil Co. 1-B John Reburn, 22-O-19, recovered 270 ft. of clean oil and made considerable gas in a drill-stem test of Cypress sand at 2,267-91 ft., and has run 5½-in. casing to 2,264 ft. for completion. This is the first Cypress production in the area.

FOR HARD FACING AND REPAIR

Amsco
WELDING
PRODUCTS



Amsco No. 459

Increases life 2 to 5 times for dippers, pug mill knives, brick dies, shredder knives, drag chain links, pulverizer hammers, sand pumps and similar parts. Amsco No. 459 is centrifugally cast . . . resists softening up to 800° F. . . . and has a Brinell hardness of 500-600. No. 459 produces a chrome-moly martensitic iron deposit and is designed for severe abrasion service with moderate impact conditions.

The application above shows Amsco No. 459 applied to the front and teeth of a manganese steel walking dragline bucket, used for stripping overburden from iron ore at a Minnesota mine. In similar applications where more severe impact coupled with abrasion is encountered, Amsco Economy Hardface is recommended.

Ask for free reprint of Hard Surfacing by Fusion Welding

American Brake Shoe Company
AMERICAN MANGANESE STEEL DIVISION
408 E. 14th St., Chicago Heights, Illinois
Offices in Principal Cities

C. R. Craft and H. H. Vickers 1 Boyd Crow, 3-L-31, a wildcat 5 miles northwest of Hartford, Ohio County, a 5 miles south of the Buford pool, has been completed on the pump making 53 bbl. of oil per day from McClosky lime at 1,441-47 ft. and 1,478-95 ft. Bottom of hole is 1,517 ft. with casing on top the pay. Formation was given a 2,500-gal. acid treatment.

Ashland Oil & Refining Co. and associates 1 R. L. O'Brien, 13-P-28, south outpost for Tar Springs production in the Griffiths pool, Daviess County, is estimated good for about 25 bbl. of oil per day following a 60-qt. shot of the pay at 1,229-41 ft. Further testing is under way.

WESTERN KENTUCKY WILDCAT FAILURE

Henderson County: Delta Drilling Co. et al 1 Wickliffe-Crutchfield, SE SW SE 15-Q-21, dry, TD 2,796 ft.

INDIANA

EVANSVILLE.—Indications of a new producing area east of the St. Wendell pool in Posey County have been given by showings encountered in Cypress sand in Charles C. Clark 1 Goeddle, NE NE SW 24-5s-12w. Saturation is at 2,346-54 ft. Casing (5½-in.) has been cemented on top preparatory to testing. Rig already is being moved in for 2 Goeddle, ¼ mile north of SE NE NW 24-5s-12w.

Two new tests are being started for the shallow Waltersburg sand pool opened last week by George Dobbs 1 Williams, SE SE SW 22-6s-7w, 4 miles northeast of the Hatfield pool, Spencer County. Max J. Lewis has location for 1 Jones, NW NW NE 27-6s-7w, a 10-acre north offset to the discovery well. Amos Shaffer will drill 1 Frank, SE NE SW 22-6s-7w, a 10-acre southeast diagonal offset. The discovery well is pumping 27 bbl. per day from the sand at 958-68 ft.

Extension development at the south end of the Rochester pool on the east bank of the Wabash River in Gibson County has resulted in completion of two more good wells in the Waltersburg sand. Ryan & Sharp 17 Berry, NE SE SE 14-2s-13w, is pumping 147 bbl. of oil and 63 bbl. of water after a 200-qt. shot in the sand at 1,941-87 ft. Their 18 Berry, NW SW SW 13-2s-13w, is making 175 bbl. of oil after a 120-qt. shot at 1,933-70 ft. No. 20 Berry, SE SE SE 13-2s-13w, also is in the sand at a total depth of 1,985 ft. and has run casing to complete.

In the upper part of the Vaughn area, Vanderburgh County, Ashland Oil & Refining Co. and associates are preparing to test 4 Nurrenbern, SW NE NW 9-7s-11w, an outpost ¾ mile north and slightly east of their 2 Nurrenbern, nearest producer, completed last week as a 70-bbl. pumper in Waltersburg sand at 1,650-55 ft. The new well has the sand at 1,703-09 ft. (elevation 412 ft.) and has run 5½-in. casing to 1,702 ft. Location has been made for 5 Nurrenbern, a 10-acre south offset to No. 4.

INDIANA SUCCESSFUL WILDCAT

Gibson County: Gilliam Drilling Co. 1 W. R. Stitt, NW NE NW 12-4s-10w, IP 92 bbl., O'Hara 2,014-19 ft. and McClosky 2,050-56 ft. and 2,086-94 ft. (Discovery well Wheatonville pool.)

INDIANA WILDCAT FAILURES

Gibson County: Calvert & Willis 1 Stunkel, NW SW NE 10-4s-10w, dry, TD 2,157 ft.

Sullivan County: Illinois Mid-Continent Co. 1 Dola Ridgeway, NE SE SE 35-6n-10w, dry, TD 1,940 ft.

Vanderburgh County: George & Wrather 1 Jackson, SW NW NW 3-5s-10w, dry, TD 2,291 ft.

Vigo County: G. Higgenbothom 1 C. Flesher, SE NW NE 5-10n-10w, dry, TD 2,585 ft.

MICHIGAN

Large Richfield Producer Sets Off Bay County Play

MOUNT PLEASANT.—Completion of Ervin Major 1 Moran, SE NE NE 2-18n-3e, Gibson Township, Bay County, good for an estimated 100 bbl. of oil an hour natural from the Richfield, has stimulated a brisk drilling play in the district. Major's big Richfield horizon producer was drilled deeper to 4,240 ft. after 5-in. casing was run and cemented at 4,228 ft. The well did not kick off and start to flow immediately following cleanout below the casing, but required some swabbing to lift salt water from the pay zone. However, after 100 bbl. of salt water or more had been recovered by the swab, flow started again.

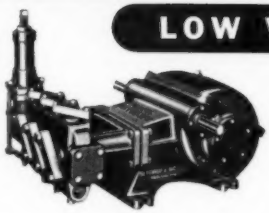
Major had started drilling operations on two new field wells, had moved rotary tools over a cable-tool hole which was delayed by a fishing job, and Mogul Oil Co. was nearing 3,000 ft. on another field well this week. It appeared now that Ervin Major would establish commercial producer at the 1 Scherwin, diagonal southeast offset to the Moran producer. Originally it appeared that this offset had missed the objective pay, but when hole was bailed down, free oil and some gas was showing. Casing was run and cemented this week in preparation for test and completion.

Supervisor of wells, P. J. Hoffmaster, called a public hearing of the State Oil Advisory Board, scheduled to be held in Lansing July 11. At this hearing, well allowables in all prorated fields in the state will be reviewed, and proposals for well spacing patterns in the currently develop-

THE OIL AND GAS JOURNAL

"He's tied up signing a lease right now!"

HIGH PRESSURE
LOW VOLUME



LOW COST MYERS PUMPS

TRIPLEX 4635-50

Myers pumps are the product of 75 years of experience. Wheatley offers a complete line of sizes available as bare pumps or complete power units. Pumping capacities range from 17 B.P.H. to 71 B.P.H. at 800 P.S.I. Pictured is the largest Myers pump offered by Wheatley.

For latest PUMPER and MYERS PUMP CATALOG send coupon below.

CLIP AND MAIL

FRANK WHEATLEY PUMP & VALVE MFR., TULSA, OKLA. 519

NAME _____

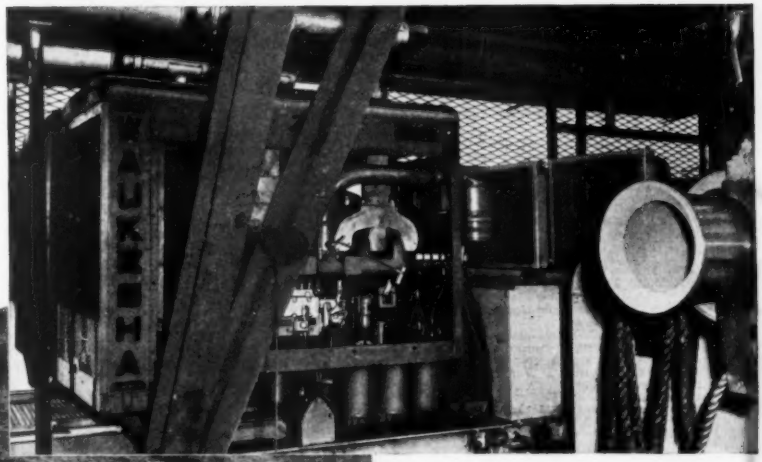
FIRM _____

ADDRESS _____

CITY _____ STATE _____

FRANK W WHEATLEY

wide SPEED and POWER range...with the SMOOTH FLEXIBILITY of steam!



● Bell & Burden are drilling Grub Lease Well A-11 at Ventura, California, with the new Hydro-drive drilling rig. Four Waukesha Model 6-WAKD Super-Duty Diesels power both drawworks and mud pumps. Built by Bethlehem Supply Co., this completely modern drawworks is designed for drilling to 7500 ft. Rugged, simple and stall-free the unit tandems the power of its two Waukesha Diesels to the drawworks through hydraulic torque converters and direct-acting air clutches. The resulting infinite range of speed and power ratios automatically gives all the smoothness and flexibility of steam. On the mud pumps the tandem drive is direct. All four Diesel units are Waukesha Model 6-WAKD—a four-stroke cycle, overhead valve, six cylinder Diesel engine, 6¼-in. x 6½-in., 1197 cu. in., that burns all "high-speed Diesel fuels" cleanly, with lively acceleration, high economy and easier starting. Get Bulletin 1115.

WAUKESHA *Diesel* POWER

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES

ing Paris field, Mecosta County. South Adams field, Bay and Arenac counties, and Butman Dundee field, Gladwin County, will be considered. It is expected that diagonal 20-acre spacing patterns for all these pools will be recommended by the Advisory Board.

MICHIGAN SUCCESSFUL WILDCAT

Gladwin County, Butman Township: H. E. Bell 1 Bronson & Fryling, NE NW NW 13-20n-1w, Dundee 3,536 ft., 62 bbl., TD 3,602 ft.

MICHIGAN WILDCAT FAILURES

Allegan County, Heath Township: Eric Schelling 1 Middlemas, NW SW SW 36-3n-14w, Traverse 1,512 ft., dry, TD 1,515 ft.

Manlius Township: Ohio Oil Co. 1 Ellinger, SE SE SE 15-3n-15w, Traverse 1,381 ft., dry, TD 1,416 ft.

Lee Township: Norman L. Stevens 1 Merril-Dunkelberger Comm., NW NW SW 28-1n-15w, Traverse 1,175 ft., dry, TD 1,189 ft.

Kent County, Byron Township: Del Fortney 1 Lubbers & Wolfe, SW SW NE 31-5n-12w, Traverse 1,702 ft., dry, TD 1,711 ft.

Lake County, Cherry Valley Township: Rovert Bond 1 Manistee Savings Bank, SE SW SW 15-18n-12w, Monroe 3,246 ft., dry, TD 3,400 ft.

Van Buren County, Columbia Township: Ronald G. Smith 1 Dobbin, NW NW SE 36-1s-15w, Traverse 1,182 ft., dry, TD 1,186 ft.

LEGAL

16,808.82 acres of Tribal Indian lands located in Township 1, North, Range 2, West; 1 North, 3 West; 1 South, 2 West; 1 South, 3 West; 1 South, 1 West; 1 South, 2 West; in the Uintah and Ouray Reservation Utah, are being advertised for lease, bids on which will be opened August 4, 1949, at 2:00 P.M., at the office of Forrest R. Stone, Superintendent of the Uintah and Ouray Indian Agency, Fort Duchesne, Utah. Full descriptions, and copies of advertisement may be obtained from Superintendent Stone or from Supervisor J. R. Schwabrow, U. S. Geological Survey, Federal Building, Casper, Wyo.

ILLINOIS

Discovery of New Pool in Franklin County Indicated

MATTOON.—Franklin County has a prospective new pool in the area about 5 miles east of Ewing where Producers Pipe Line Co. 1 King, NW NE SW 16-5s-4e, recovered 110 ft. of clean oil and 10 ft. of slightly mud-cut oil in a drill-stem test of the O'Hara limestone at 3,058-62 ft. Operators have run 7-in. casing to 3,052 ft. preparatory to completion of the well. Hole is bottomed at 3,063 ft.

Illinois Mid-Continent Co. and Aurora Gasoline Co. 1 R. Richardson, NW NE SW 9-1n-5w, which is opening a new pool in Wayne County, is flowing 35 bbl. per hour natural after perforating casing in the McClosky lime at 2,994-3,000 ft. It flowed 45 bbl. of clean oil in the first hour. Casing was run to 3,030 ft. on bottom. Location is 2 miles north of the town of Orchardville and about 6 miles northwest of the Johnsonville pool, the nearest production.

In Jefferson County, Dunbar Drilling Co. 1 Wilson, NE NE SW 20-4s-3e, about 3 miles southeast of the King field, is swabbing at the rate of 100 bbl. of oil per day and opens a new area. Production is from the McClosky with casing perforated at 2,940-45 ft. Formation was acidized with 3,000 gal. Casing first was perforated at 2,962-64 ft., where the well made water. Bottom of the hole is 2,976 ft., plugged back to 2,947 ft.

Charles A. Baldwin 1 James, SW SW SW 27-6n-14w, Jasper County, which opens a new area 3 miles north of the Ste. Marie pool between the Clay City-Noble and Robinson fields, has been completed pumping 65 bbl. per day after a 2,000-gal. acid treatment. Production is from the Rosiclare with casing perforated at 2,667-77 ft. and 2,689-90 ft. Hole was drilled to 2,720 ft. and casing run to bottom.

Oil Management Co. and associates have completed 1 Hare, NE NW SE 1-1s-13w, 1½ miles northwest of the Mount Carmel pool, Wabash County. With casing at 1,658 ft. and hole open to 1,671 ft. in the Biehl sand, the well is pumping 35 bbl. of oil with about 15 bbl. of water per day.

C. E. Skiles 1 McCormick, SE SE SW 4-9s-9e, west of the North Junction pool, in Gallatin County, swabbed at the rate of 1 bbl. per hour from Pennsylvanian sand at 996-1,005 ft. after a shot. Testing continues with prospects of opening a new productive area between Shawneetown and Ridgeway.

ILLINOIS SUCCESSFUL WILDCAT

Wabash County: Oil Management Co. 1 Hare, NE NW SE 1-1s-13w, IP 35 bbl., Biehl sand 1,657-71 ft., TD 1,672 ft.

ILLINOIS WILDCAT FAILURES

Christian County: Collins Bros. 1 A. H. Carzine, NW NE SW 35-14n-1e, dry, TD 2,402 ft.

M. H. Richardson et al 1 Sara Wilt, SE SE SW 1-12n-1w, dry, TD 2,550 ft.

Clay County: C. E. Skiles 1 Weed, NE SE NE 31-4n-6e, dry, TD 2,989 ft.

Lawrence County: C. E. Skiles 1 Tricker, NE NW SW 6-2n-12w, dry, TD 2,236 ft.

Madison County: Obering et al 1 Nigli, SW SW NE 29-5n-5w, dry, TD 2,000 ft.

Marion County: Buell & Doran 1 Hines, NE NE NE 30-4n-3e, dry, TD 2,199 ft.

Montgomery County: Benoist Bros. 1 Minter SW SE NE 14-7n-4w, dry, TD 887 ft.

Shelby County: Reward Oil Co. 1 Moran, NE SW SE 33-10n-5e, dry, TD 2,075 ft.

Wayne County: T. B. Dirickson 1 Creigton, SW NW SW 36-1s-8e, dry, TD 3,375 ft.

Empire Trust Company

NEW YORK

Capital Funds.....$9,195,675.26
Total Resources $130,626,276.03

Directors

DEAN MATHEY
Chairman of the Board

FRANK V. BALDWIN
Retired

C. KENNETH BAXTER
Chairman of the Board
Deep Rock Oil Company

JOHN T. CAHILL
Cahill, Gordon, Zachry & Reindel

EVERETTE L. DeGOLYER
DeGolyer & MacNaughton
Dallas, Texas

GEORGE A. EASLEY
Vice President, Salt Dome Oil Corp

DEAN S. EDMONDS
Pennie, Edmonds, Morton & Barrows

CHARLES S. GARLAND
Alex, Brown & Sons
Baltimore, Maryland

ARCHIBALD A. GULICK
Alexander & Green

PAUL H. HUDSON
Executive Vice President and Secretary

GEORGE S. LEISURE
Donovan, Leisure, Newton, Lombard & Irvine, New York

JOHN L. LOEB
Partner, Carl M. Loeb, Rhoades & Co.

GRAHAM D. MATTISON
Dominick & Dominick, New York

HENRY C. BRUNIE
President

DONALD H. McLAUGHLIN
President, Homestake Mining Co.

JULIAN S. MYRICK
Vice President
Mutual Life Insurance Co.

CLENDENIN J. RYAN
President, Big Horn Cattle Co. of Colorado

ARTHUR A. SEELIGSON
President, Transwestern Royalty Co.
San Antonio, Texas

JAMES H. VAN ALEN
Vice President, Farrar, Straus & Co., Inc.

Specialized experience in the financing of oil, gas and other natural resource properties.

Main Office
120 BROADWAY, NEW YORK

Fifth Avenue Office
580 FIFTH AVENUE

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Condensed Statement of Condition, Dec. 31, 1948, available upon request.

1949-1950 DIRECTORY NOW READY . . . . . .

The Oil and Gas Journal's DIRECTORY of REFINERIES and NATURAL GASOLINE PLANTS is just off the press. It gives you titles, names and addresses of key men in all major departments. It is an 103-page bound volume of size convenient for library or file.

An alphabetically arranged list of refineries in the United States and Canada, showing their key operating, purchasing and technical personnel.

A similarly arranged list of Natural Gasoline Plants and Cycling Plants throughout the country, with the main office, plant location and key personnel shown in each case.

A geographically arranged survey of the active refineries in the United States, Canada and Mexico, showing their crude oil and cracked gasoline capacities and the type of products manufactured . . . plus a list of refineries that are now shut down.

A survey of the Gasoline and Cycling plants in each state, showing input and output capacities.

PRICES

Single copies	**$10.00 each**
2 to 4 copies	**9.00 each**
5 to 9 copies	**8.00 each**
10 or more copies	**7.00 each**

Mail orders to Reader Service Department

Published and Sold only by

THE OIL AND GAS JOURNAL

TULSA 1, OKLAHOMA

PERMIAN BASIN

North Snyder Gets Southern Trend

MIDLAND.—Lipscomb & DeLange 1 Wren, 467 ft. from north and east lines of Tract 11, Section 20, J. P. Smith Survey, Scurry County, had prospects of extending the southern part of North Snyder field approximately 1 mile south and west. While production tests were not to be made until it is drilled to around 6,900 ft., field reports indicated it had good oil shows. Top of the reef was minus 4,080 ft., said to be 40 ft. low to Sunray 1 Brown and 53 ft. low to the reef in Barnsdall Oil Co. 1 Wren, which according to some observers was bearing out the opinion that the field would thin out and be limited on the south side, and eventually establish a southwest-northeast trend. Elevation on the Lipscomb & DeLange 1 Wren was 2,504 ft. Operators were drilling below 6,685 ft. at last report.

In the south extension to the field, Pure Oil Co. 1 W. H. Adams, northwest offset to Sunray 1 R. B. Brown, flowed 13.7 bbl. of 41°-gravity oil in 1 hour on a drill-stem test in the reef from 6,515-87 ft. Gas-oil ratio was 975 cu. ft. Recovery from the pipe was an additional 88 bbl. of oil. Length of the test was 4 hours and 20 minutes. Pure staked location for its 2 W. H. Adams, 467 ft. from the south and 665 ft. from west lines of the southeast quarter of 383-97-H&TC.

Bert Fields, Dallas, has staked location for 1 P. T. Harmon, in the SE NE 210-97-H&TC, for a 7,000-ft. test. It is ½ mile north and ¼ mile west of Magnolia Petroleum Co. 1 Eicke.

In the Diamond field, Hiawatha Oil & Gas Co. 2 L. M. Wilson, SW SW 183-97-H&TC, completed as a 1-mile southeast extension, flowing 792 bbl. of 44.5°-gravity oil natural in 24 hours through ¾-in. choke. The reef was perforatec at 6,787-99 ft.

In Sharon Ridge Canyon field, Lion Oil Co. 1 Marshbanks, outpost test in SE SW 164-97-H&TC, set casing on bottom at 6,693 ft. The well was reported to have logged a thick section showing oil. Top on the Canyon was not reported. Lion staked three locations which were to start immediately. These were in Sections 196, 197, and 183.

Southwest of Snyder, Magnolia 2 Winston Brothers, ½-mile east offset to its Kelly field discovery, completed for 59.3 bbl. of 41°-gravity oil, plus 3½ bbl. of salt water, through 6 64-in. choke, from open hole between 6,855-62 ft., total depth.

Tom Green County.—Plymouth Oil Co. 9-B J. Wiley Green, 194-11-SPRR, became the 13th Strawn producer in Susan Peak field. Daily potential was 612 bbl. of 40°-gravity oil, based on an 8-hour test of 204 bbl. through ¾-in. choke, from open hole at 4,738-65 ft. Flowing pressures were 325 psi. on tubing and 200 psi. on casing. The same operators' 10-B Green, ¼-mile south extension, was waiting on connections after flowing into pits, naturally, at the rate of 10-15 bbl. an hour. Plymouth completed its Canyon discovery in the field for a pumping potential of 67.7 bbl. of 42°-gravity oil a day, plus some water. The discovery was 3-A J. D. Robertson, SE NE 193-District 11, SPRR Survey. Pay was from 4,360-4,400 ft.

M. R. Davis and Hiawatha 1 R. C. Jones, wildcat 3¾ miles west of the south end of Susan Peak, prepared to drill out after squeezing perforations at 3,752-70 ft. Further tests were then to be made in the Canyon around 4,400 ft. Perforations at the above interval were swabbed dry, with packer at 3,695 ft. The section was then washed with 500 gal. of mud acid and treated with 1,000 gal. of regular acid, but further swabbing recovered only salt water down to 2,500 ft. off bottom.

Midland County.—Standard-Fryer Drilling Co., Dallas, has taken over a 5,004-ft. wildcat 13 miles east of the city of Midland, drilled in 1945 by Seaboard Oil Co. and Standard Oil Co. of Texas as the 1 Andrew Fasken, SW NE 7-36-T2S-T&P. According to reports, the well was to be drilled to the Clear Fork, or 8,000 ft. The contract further stated that Standard-Fryer was to start a wildcat to test the Ellenburger on the block, within 1 year after completion of the 8,000-ft. test. The contract could be satisfied by drilling to the Ellenburger in the Fasken well, it was said. Some observers believed the Ellenburger might be below 14,000 ft. in that area.

According to field reports, Magnolia had water shut off at its 18-B Cowden, southeast extension to Dollar Hide field. Swabbing operations were under way, on the Fusselman section of the Silurian, from perforations at 11,000-26 and 11,056-82 ft. Recovery in one 24-hour test was 285 bbl. of oil, cut 5 per cent with basic sediment, and no water. Four and one-half miles northeast of the field, George P. Livermore, Inc., and Deep Rock Oil Corp. 1-A Mayhew, 20-A51-PSL, topped the Mississippian at 8,585 ft., and was drilling ahead below 8,613 ft. Elevation is 3,299 ft.

Coke County.—Humble Oil & Refining Co. 1 Brunson, Section 331, Nicholas Eastland Survey, 2 miles southeast of Bronte field, recovered 300 ft. of slightly oil and gas-cut mud on a drill-stem test in lime at 5,166-86 ft. Gas, estimated at 20,000 cu. ft. daily, came to the surface in 20 minutes. Operators drilled to 5,204 ft. and ran a 45-minute test with packer at 5,195 ft. Gas showed in 5 minutes and recovery was 300 ft. of slightly oil and gas-cut mud. Drilling continued below 5,284 ft. in lime and shale. The section tested was tentatively identified as Strawn.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCATS

Borden County: Sinclair Oil & Gas Co. 1 Sterling Williams, NE NE 45-32-T6N-ELRR, 9½ mi. W. and 3½ mi. N of Gail, flowed 663½ bbl. of 42.8°-gravity oil a day, 2-in. opening on 2½-in. tubing. Ellenburger perforated at 9,915-45 ft., TP 100 psi., ED, 10,035 ft. elev. 2,947 ft.

Howard County: Magnolia Petroleum Co. 1-A Herman Gartner, NW NW 67-20-Lavaca Navigation Co. Sur., NE corner of county, pumped 60 bbl. of 41°-gravity oil in 24 hr., Pennsnylvanian 8,199 ft., TD 8,542 ft., PB 8,490 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Borden County: Seaboard Oil Co. of Delaware 1 Clayton & Johnson, SW SW 37-31-T6N-T&P, about 3 mi. NE Sinclair 1 Williams, dry, TD 8,406 ft., top reef 8,286 ft., elev. 2,617 ft.

Kent County: Ohio Oil Co. 1 J. J. Emery estate, 39-2-H&GN, 15 mi. SW Spur, dry, TD 7,842 ft., San Andres 1,320 ft., Glorietta 2,262 ft., Clear Fork 2,470 ft., Wolfcamp 4,460 ft., reef 6,082 ft., Ellenburger 7,807 ft., elev. 2,223 ft., DST in reef lime had oil and gas-cut mud.

Kimble County: Atlas Exploration Co. 1 George Dutton, NW SW NE 47-4-TWNG, 12 mi. NW Junction, dry, TD 2,874 ft.

Midland County: Magnolia Petroleum Co. 1 Mary Turner, NW SE 46-37-T2S-Leonard Leech Sur., 13 mi. SE Midland, dry, TD 8,522 ft., San Andres 4,150 ft., "Tex Harvey" sand 7,932 ft., DST 7,930-66 ft., 1 hr. 45 min., recovered 80 ft. gas-cut mud; DST 7,980-8,035 ft., recovered gas-cut mud, 240 ft. of heavily oil-cut mud, elev. 2,651 ft.

Mitchell County: Capital Co. 1 Mary Ebie, 12-25-T&P, 5 mi. N Loraine, dry, TD 7,565 ft., San Andres 1,360 ft., Ellenburger 7,498 ft., elev. 2,425 ft.

Reeves County: Bonita Oil Co. 1 Chapman, 11-2-H&GN, 30 mi. N Pecos, dry, TD 3,979 ft., Delaware sand 3,861 ft., swabbed 6 bbl. oil after shot at 3,851-68 ft.

Scurry County: W. A. Moncrief 1 Dewey Moore, NW NW Lot 58, Sec. 38, Kirland & Field Sur., 2 mi. SW Snyder, dry, TD 7,978 ft., reef 6,810 ft., Ellenburger 7,930 ft., by samples, elev. 2,400 ft.

C. L. Norsworthy Jr., 1 E. H. Williamson, NW NW 256-97-H&TC, 8 mi. NW Snyder, dry, TD 7,638 ft., reef 7,035 ft., elev. 2,473 ft.

Sterling County: Pan American Production Co. 2 R. W. Foster, NE NW 10-13-SPRR, 9 mi. SW Sterling City, dry, TD 5,588 ft., San Andres 1,655 ft., Glorietta 2,429 ft., Clear Fork 2,640 ft., elev. 2,472 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—One-half mile north of the Crossroads discovery well, Mid-Continent Petroleum Corp. 1-D Sawyer, SW NE 27-9s-36e, was drilling ahead at 11,046 ft. A drill-stem test at 9,491-95 ft., open 4 hours, recovered 900 ft. of water cushion and 4,650 ft. of salt water. A 2½-hour test at 9,595-9,662 ft. recovered the water blanket and 770 ft. of salt water. At 9,692-9,780 ft., the recovery in 2 hours was 900 ft. of water blanket and 8,000 ft. of salt water. Tentative top on the Pennsylvanian was 9,495 ft., with elevation of 4,052 ft.

Amerada Petroleum Corp. 1-CA State, SE SE 9-10s-36e, was plugged back to 9,872 ft. from total depth of 13,123 ft. and shut down for orders. A 30-minute drill-stem test of the Ellenburger at 13,062-95 ft. recovered 4,000 ft. of water blanket plus 360 ft. of salt water, and 630 ft. of salt water-cut mud. An 80-minute test at 9,666-9,872 ft., in the Pennsylvanian, recovered 90 ft. of drilling mud with no shows.

Amerada 1-BTA State, 2-12s-33e, recovered 630 ft. of salt water on a 1-hour test at 11,464-506 ft., total depth, and shut down for orders.

Northwest of Tatum, Humble Oil & Refining Co. 1-X State, NW NE 31-11s-35e, was drilling below 11,886 ft. in shale and lime.

Amerada 1 Caudle, SE NE 10-12s-33e, was drilling below 10,600 ft., with no shows reported below the last drill-stem test at 9,425 ft. Amerada 1-BTB, 26-12s-33e, was drilling at 9,554 ft.

Northeast of Lovington, McAlester Fuel Oil Co. 1 Denton, 11-15s-37e, ran a 3-hour and 40-minute drill-stem test, in either Wolfcamp or Pennsylvanian at 9,149-96 ft., and recovered 3,169 ft. of 39°-gravity oil, plus 270 ft. of heavily oil and gas-cut mud. Flowing pressure was 1,145 psi., and shut-in pressure was 3,400 psi. in 15 minutes.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Lea County: Devonian Oil Co. 2 Santa Fe, SE SW 9-9s-37e, 5 mi. NE Crossroads field, dry, TD 5,208 ft., San Andres 4,170 ft., elev. 4,012 ft.

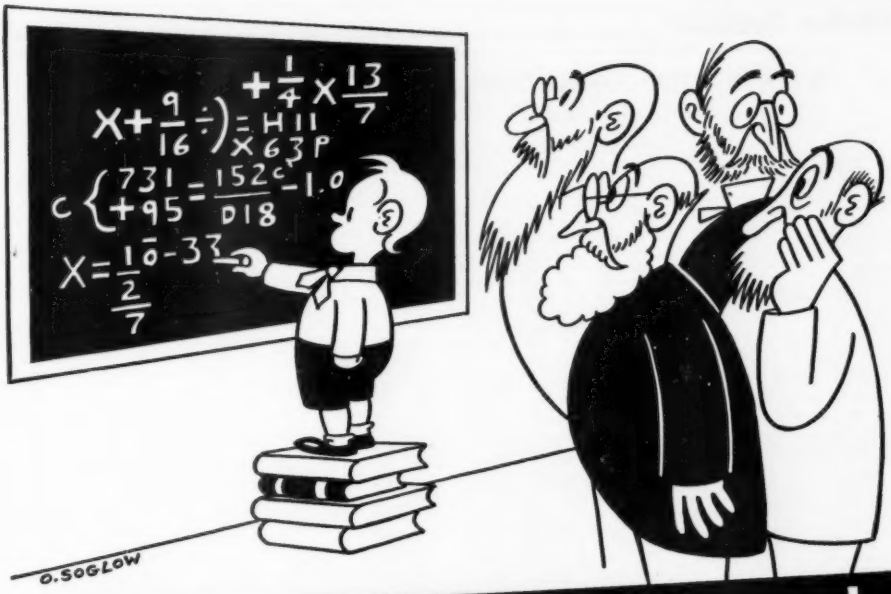
Magnolia Petroleum Co. 1 Cox-Federal, SW SW 1-9s-36e, 5 mi. NE Crossroads field, dry, TD 12,852 ft., PB 9,685 ft., San Andres 4,100 ft., Glorietta 5,200 ft., Abo 7,730 ft., Pennsylvanian 9,010 ft., Mississippian 12,110 ft., Devonian 12,539 ft., elev. 4,058 ft.

Tulsa University to Build Petroleum Science Hall

Construction is now under way on a new $850,000 Petroleum Science Hall at the University of Tulsa. Ten oil companies and three oil men provided funds for the structure. The new hall will be ready for occupancy with the opening of the 1950 fall term. It will contain 15 laboratories and geological sample rooms, research facilities, and preparation rooms.

Seminole Plans Celebration

The twenty-third anniversary of the discovery of oil in Seminole, Okla., will be celebrated July 19. The Seminole chapter of American Petroleum Institute has designated the day as "Boom Day."



You'll be surprised at these figures!

- 80 million Americans own $48 billion of U. S. Savings Bonds.
- 20,000 of the nation's 38,000 firms employing 100 or more persons are operating Payroll Savings Plans.
- 7,500,000 workers are buying an individual average of $20 of Bonds per month.
- For the year 1948, sales of Series E Bonds exceeded *redemptions* by $495,148,000. The net figure for all Series after redemptions and maturities was $2,151,140,000.

What does all this mean to you? Well, it means first of all that your Treasury Department is successful in its program of increasing the nation's economic security by spreading the national debt. Secondly it means that most of the nation's business leaders recognize the value of the Payroll Savings Plan sufficiently to promote it within their companies.

For example...

To give you some idea of the Plan's growing popularity: 86,384 employees of a prominent electrical manufacturing company were investing in Bonds at the rate of $30,005,270 as of the end of 1948. This is a gain of nearly 100% over 1947, when 45,000 employees participated in that company. The treasurer of a well-known shoe company reported that, of his concern's 19,060 employees, 9,240 were in the Plan and had invested $146,807.32 in Bonds via deductions during the preceding month.

Why promote it?

We all know how buying Bonds builds an individual's future security. But there are *company* benefits too! Nation-wide experience shows that Payroll Savings increases each participating employee's peace of mind—makes him a more contented, more productive worker. It reduces absenteeism, lowers accident rates, increases output, and improves employee-employer relations.

It's easy to boost participation

1. See that a top management man sponsors the Plan.

2. Secure the help of the employee organizations in promoting it.

3. Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Plan's benefits to them.

4. Make a person-to-person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Nation-wide experience indicates that 50% of your employees can be persuaded to join—without high-pressure selling. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bond Division.

The Treasury Department acknowledges with appreciation the publication of this message by

THE OIL AND GAS JOURNAL

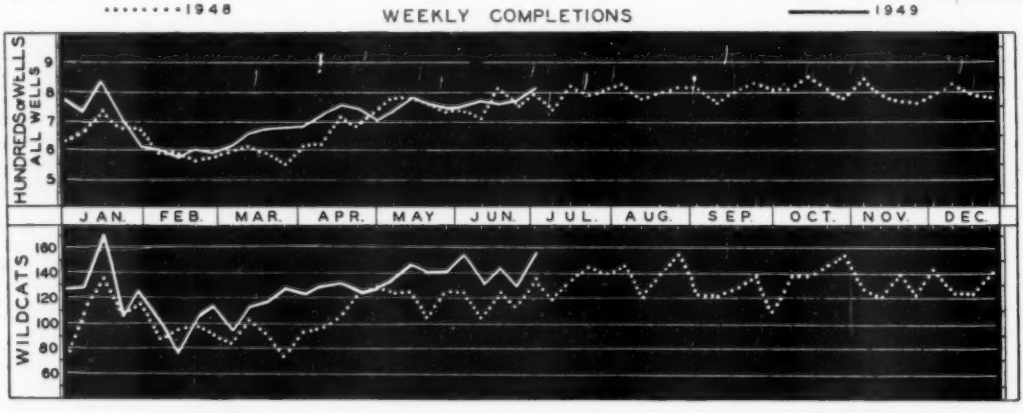
Tulsa 1, Oklahoma

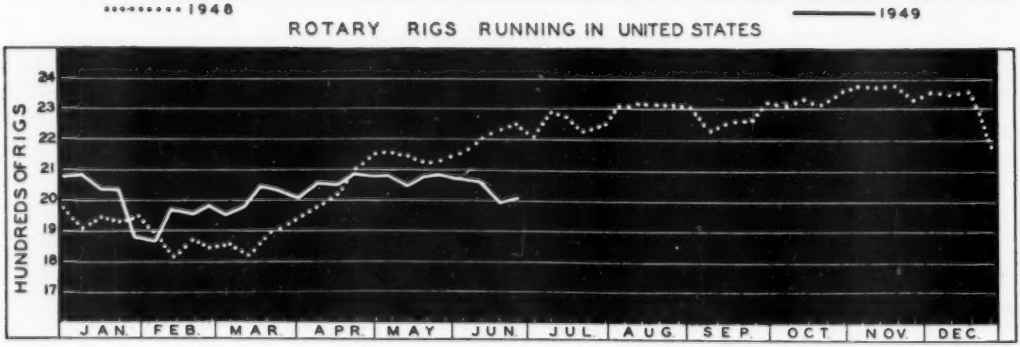
This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

WEEKLY WELL COMPLETIONS . . . . WEEK ENDED JULY 2, 1949

	Total of all wells					26 wk.		Wildcat completions and discoveries					Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	10	5	0	*5	10,979	559	754	0	0	0	0	0	0	0	0	0	0
Pennsylvania	19	7	5	†7	39,500	807	1,291	0	0	0	0	0	0	0	1	1	2
West Virginia	10	3	7	1	32,570	240	379	0	0	1	0	1	1	0	6	6	13
Ohio	18	10	5	3	41,445	518	645	0	0	0	0	0	1	0	2	19	22
Indiana	24	12	1	11	44,710	592	462	1	0	0	4	5	12	0	0	116	128
Kentucky	17	10	1	6	24,071	424	313	0	0	0	3	3	9	0	0	30	39
Illinois	63	35	0	28	149,704	1,154	1,031	1	0	0	9	10	26	0	1	186	213
Michigan	28	16	0	‡12	61,412	468	356	1	0	0	6	7	19	0	1	153	173
Kansas	55	27	8	20	177,051	1,477	1,442	5	0	0	7	12	31	0	4	191	226
Neb., Mo., Iowa	0	0	0	0	0	14	2	0	0	0	0	0	0	0	0	10	10
Oklahoma	109	56	5	48	402,255	2,073	1,954	7	0	0	18	25	75	9	10	295	389
Texas	308	171	20	117	1,269,694	6,606	5,501	7	0	3	56	66	199	29	58	1,153	1,439
North Central (Dist. 7-B & 9)	110	51	1	58	288,675	2,157	1,693	1	0	0	23	24	86	0	9	451	546
West (Dist. 7-C & 8)	79	64	1	14	418,803	1,584	1,482	2	0	0	9	11	28	0	2	133	163
Panhandle (Dist. 10)	17	10	7	0	52,700	512	286	0	0	0	0	0	1	0	0	2	3
Eastern (Dist. 5 & 6)	10	4	0	6	46,911	337	250	0	0	0	3	3	3	2	3	71	79
Gulf Coast (Dist. 2 & 3)	57	27	6	24	299,968	991	896	2	0	1	7	10	44	21	28	198	291
Southwest (Dist. 1 & 4)	35	15	5	15	162,637	1,025	894	2	0	2	14	18	37	6	16	298	357
Louisiana	48	27	3	18	289,905	1,012	1,023	4	1	0	3	8	28	10	3	102	143
Northern	23	10	3	10	70,014	338	676	0	0	0	2	2	1	2	0	43	46
Southern	25	17	0	8	219,891	674	347	4	1	0	1	6	27	8	3	59	97
Arkansas	10	4	0	§6	45,369	144	137	0	0	0	1	1	2	0	0	28	30
Mississippi	4	1	0	3	32,809	178	191	0	0	0	2	2	4	0	1	52	57
Southeastern States	0	0	0	0	0	23	22	0	0	0	0	0	1	0	0	20	21
Montana	9	2	0	7	17,886	110	120	0	0	0	4	4	1	0	1	16	18
Wyoming	7	5	0	2	30,933	287	219	1	0	0	0	1	13	0	0	51	64
Colorado-Utah	2	2	0	0	8,597	64	119	0	0	0	0	0	1	0	0	25	26
New Mexico	8	5	1	2	42,540	270	302	0	0	0	2	2	6	0	0	26	32
California	61	50	0	11	295,541	1,350	1,407	1	0	0	9	10	25	0	3	229	257
Total United States	810	447	58	307	3,016,971	18,370	17,672	28	1	4	124	157	454	48	91	2,709	3,302
Total previous week	773	465	54	254	2,810,339	17,560	16,881	19	3	5	100	127	426	47	87	2,585	3,145
Total July 3, 1948	791	439	56	296	2,737,402			16	1	5	110	132	387	36	135	2,326	2,884

Service wells included: *5, †7, ‡3, §2.





DAILY AVERAGE PRODUCTION FOR WEEK

	July 2 crude oil	B. of M. June demand	June 25 crude oil
Alabama	1,150	1,550	1,250
Arkansas	72,500	86,000	72,650
California	918,350	940,000	919,000
Colorado	63,900	65,000	64,700
Eastern	58,100	60,850	58,000
Florida	1,425	1,400	1,300
Illinois	179,400	165,000	178,900
Indiana	25,800	23,000	25,000
Kansas	278,150	300,000	294,300
Kentucky	23,300	21,000	23,300
Louisiana	489,475	487,000	498,600
North Louisiana	105,750		108,600
South Louisiana	383,725		390,000
Michigan	39,700	46,000	41,400
Mississippi	100,400	114,000	97,500
Montana	29,200	24,000	27,700
Nebraska	600	700	500
New Mexico	137,450	126,000	137,900
Oklahoma	394,600	405,000	407,250
Texas	1,878,575	2,210,000	1,908,000
Dist. 1 (Southwest)	25,950		26,095
Dist. 2 (Southwest)	116,050		118,925
Dist. 4 (Southwest)	182,575		185,750
Dist. 3 (Gulf Coast)	349,575		355,430
Dist. 5 (Eastern)	33,725		34,350
Dist. 6 (Eastern)	81,950		83,250
East Texas field	236,425		242,600
Dist. 7-C (West)	41,950		42,150
Dist. 8 (West)	520,675		529,200
Dist. 7-B (W. Central)	59,225		59,975
Dist. 9 (N. Central)	137,250		137,275
Dist. 10 (Panhandle)	93,225		93,000
Utah	850	500	600
Wyoming	130,400	123,000	123,900
Total United States	*4,823,325	5,200,000	4,881,750
Change from previous week, dn.	58,425		
Canada	59,135		

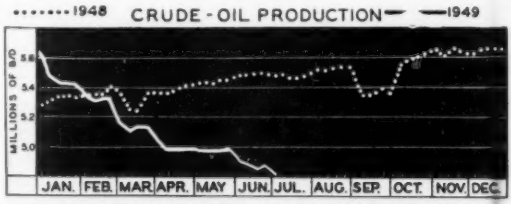
Total U. S. production January 1-July 2 ..... †947,839,085 bbl.
Same period last year (crude plus cond.) ..... 1,004,602,030 bbl.

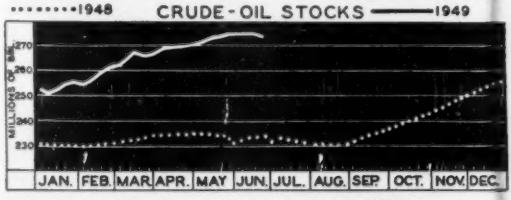
*Not including 79,030 bbl. condensate. †Including 15,326,650 bbl. condensate.

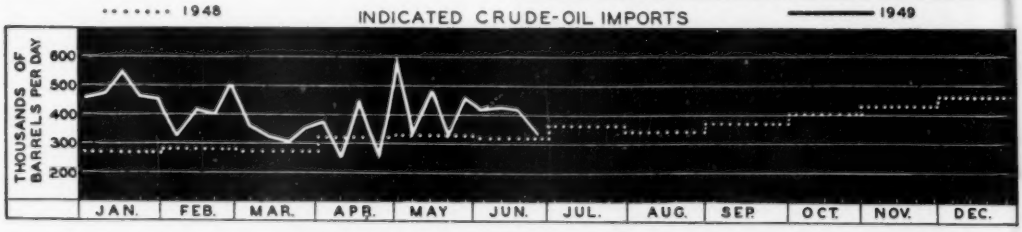
CRUDE STOCKS BY STATES OF ORIGIN

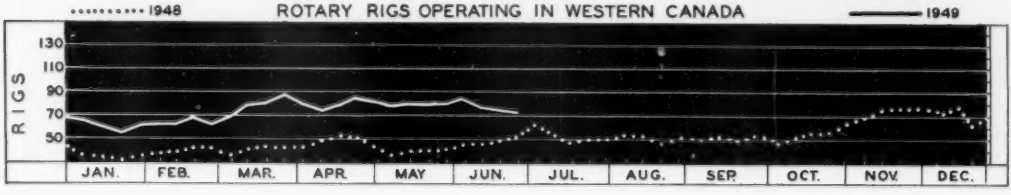
(Thousands of barrels)

State of origin—	June 25, 1949	June 18, 1949	June 26, 1948
Pennsylvania Grade	2,954	3,004	2,704
Other Appalachian	2,101	2,067	756
Ill., Ind., Mich.	14,384	14,391	10,869
Arkansas	2,926	3,002	2,649
Louisiana	15,076	14,980	11,689
North	3,288	3,339	3,014
Gulf	11,788	11,641	8,675
Mississippi	3,318	3,277	2,776
New Mexico	7,634	7,795	4,987
Oklahoma and Kansas	40,492	40,402	34,763
Texas	128,674	128,782	113,634
East Texas	17,505	17,934	16,395
West Texas	51,439	51,368	42,981
Texas Gulf	30,037	30,247	29,049
Other Texas	29,693	29,233	25,209
Rocky Mountain	14,078	14,233	9,111
California	34,619	34,877	30,166
Foreign	7,858	8,146	5,528
Total United States	274,114	274,956	229,632







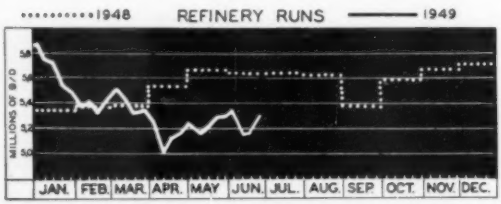


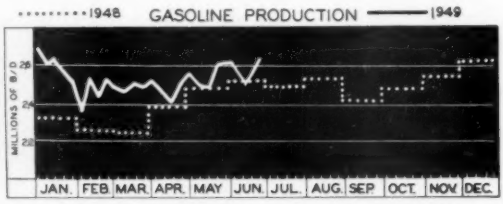
A.P.I. REFINERY REPORT, JUNE 25

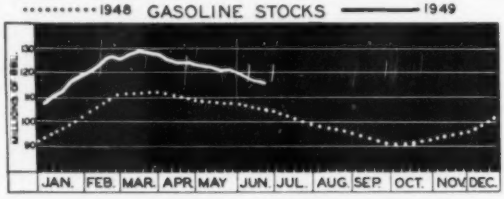
(Thousands of barrels)

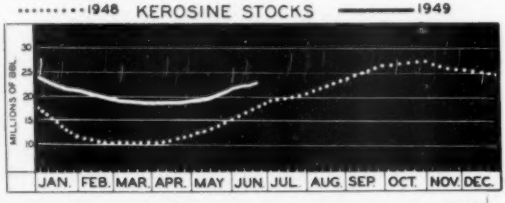
District—	Crude runs daily avg.	Daily average production: Gasoline*	Kerosine	Distillate	Residual	Stocks at refineries, bulk terminals, in transit and in pipelines: Gasoline†	Kerosine	Distillate	Residual	Bureau of Mines, June 1948: Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	700	278.7	34.7	94.7	157.4	27,803	9,842	21,386	10,094	898	321.9	51.6	177.6	220.4
Appalachian:														
District 1	97	38.7	3.4	7.1	9.4	2,481	395	711	493	104	43.1	7.8	13.3	12.3
District 2	61	27.6	2.1	4.0	12.0	1,106	163	201	272	59	31.7	1.9	5.5	12.4
Ind., Ill., Ky.	900	494.1	45.4	116.3	153.3	25,068	3,898	9,680	5,473	894	481.3	53.5	117.7	152.7
Okla., Kans., Mo.	432	240.0	16.7	82.7	60.7	11,286	1,390	4,620	2,486	469	235.5	22.2	87.6	77.2
Inland Texas	218	152.4	9.6	21.1	42.4	4,414	551	776	1,131	248	152.8	14.4	25.3	58.6
Texas Gulf Coast	1,254	672.3	69.6	174.0	238.2	15,473	3,516	9,761	8,334	1,406	614.3	99.3	309.0	265.4
La. Gulf Coast	396	210.3	33.2	94.6	41.0	5,564	1,955	3,864	2,231	428	182.7	45.7	89.5	75.3
N. La. and Ark.	73	29.6	5.7	9.1	16.2	2,663	440	941	248	83	28.9	7.7	14.4	18.8
Rocky Mountain:														
New Mexico	11	5.7		1.6	2.7	56	25	69	28	12	6.1	0.5	1.6	3.3
Other Rocky Mtn	165	83.3	6.3	27.3	32.0	3,201	305	1,398	971	154	65.9	3.9	25.2	30.3
California	1,015	404.7	10.2	102.9	357.0	16,600	633	9,642	34,385	877	364.5	4.3	131.0	352.9
June 25, 1949‡	5,322	2,637.4	236.9	735.4	1,122.3	115,715	23,313	63,049	66,146	5,632	2,528.7	312.8	997.7	1,279.6
June 18, 1949	5,171	2,571.1	218.6	746.8	1,099.0	116,403	22,504	61,445	65,594					

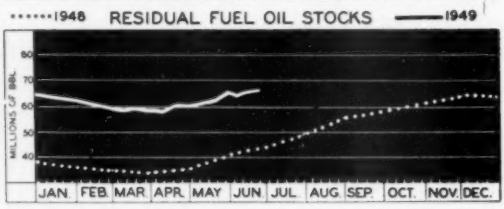
*At refineries including natural blended. †Finished and unfinished. ‡Comparable data for 1948 on new basis not available.

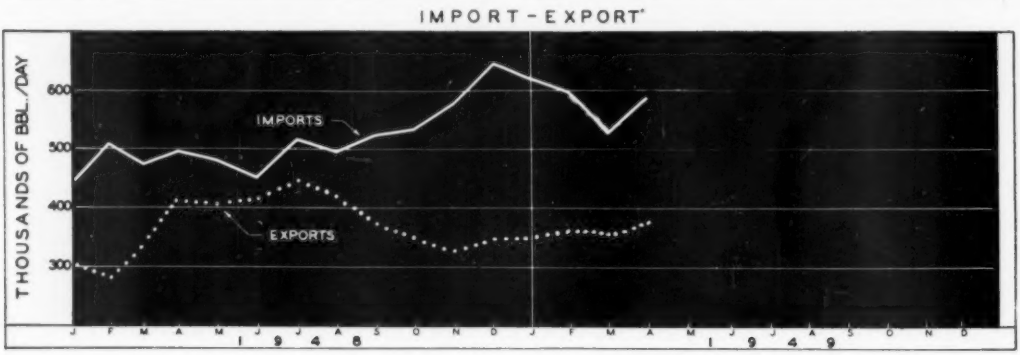












CRUDE PRICES
GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.78			
19-19.9	1.85			
20-20.9	1.93	$2.25		$2.12
21-21.9	2.00	2.27		2.14
22-22.9	2.07	2.29		2.16
23-23.9	2.13	2.31		2.18
24-24.9	2.20	2.33	$2.56	2.20
25-25.9	2.26	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.40
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

IT has been just about a year since marketing officials abandoned plans used to allocate gasoline supplies and released their sales departments from restrictions on new gasoline accounts. Statistical data indicate that distributors and jobbers immediately started reducing above-normal inventories, leaving more gasoline in primary storage. This produced a smaller indicated domestic demand for August than the average for June. The normal increase from June to August is about 1.3 per cent. This trend toward smaller distributor and jobber inventories seems to have continued with many tanks now down to minimum working levels.

Reductions in gasoline stocks so far this season have been rather disappointing, with primary inventories above 115,000,000 bbl. on June 25. These high stocks have not resulted from lack of gasoline consumption, since new all-time demand records are being set. The real reason can be found in the condition of light and heavy-fuel markets. Sales and prices of fuels have been down, so refiners have increased the yields of gasoline. In spite of greatly reduced refinery runs, refinery production of gasoline is above last year. In a recent 4-week period, stocks were reduced at the rate of 177,000 bbl. daily but the reduction would have been more than 400,000 bbl. daily if last year's yields could have been applied to this year's runs.

In the New York Harbor area fuel oils remained in the summer slump. Sales officials said the "price protection" plan had failed to stimulate any major movement, and there were rumors of new plans to be tried in the effort to encourage summer purchases. The open market in motor fuel continued sluggish.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of July 4, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 73-75 octane	9⅝-9⅞	11-11.5	9⅛-10
Premium gasoline, 78-80 octane	10⅜-11	12-12.5	10⅛-11
42-44 w.w. kerosine	8-8½	7.5-8.4	7.50-8
No. 2 straw fuel oil	6½-7	6.5-7.4	6⅜-6½
No. 6 residual	$0.85-0.90	$1.60	$1.20-1.25

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5½	5	5¼
Grade 18-55	6.6	6	6.3

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	11
750 vis., No. 3-4 neutral	14
2,000 No. 5-6 neutral	16-16.5

LUBRICATING OILS
Mid-Continent

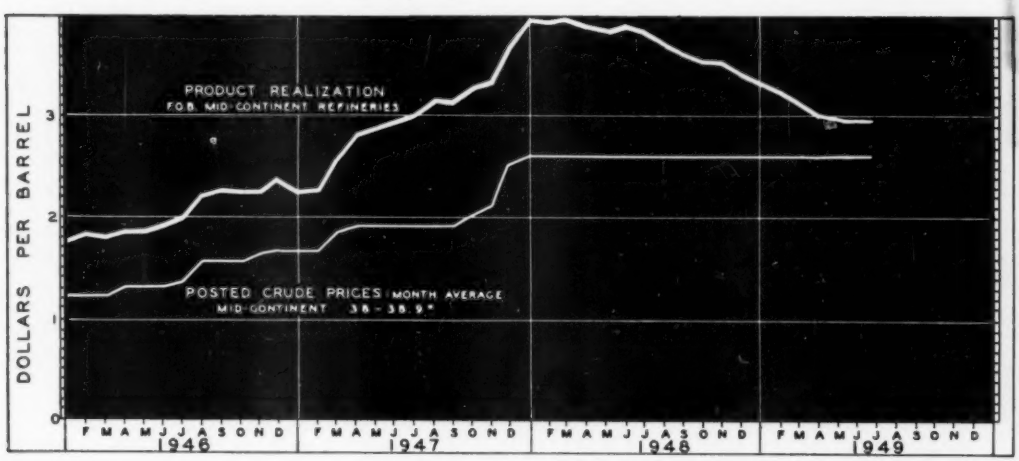
150-160 vis., D bright stock, 0-10 pp.	19
200 vis., No. 3 neutral, 0-10 pp.	12-14

Western Pennsylvania

144-155 vis., 10 p.t. bright stock	19.5
180 vis., 0 p.t. neutral	20.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	4.75



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil

EQUIPMENT MEN ... in the News

Barnes Co. Opens Two New Branch Offices

H. W. NELSON

FRED J. UNDERWOOD

John Ford, Jr., vice president of W. M. Barnes Co., recently announced the opening of new company offices in New York City and Edmonton, Alta., Canada. The latter office will be known as W. M. Barnes Co. of Canada, Ltd.

The New York office will be under the direction of H. W. Nelson, recently appointed vice president of Barnes Co. Nelson is also president of H. W. Nelson Co., an organization that has been primarily engaged in railroad construction since 1910.

The new office at Edmonton will be managed by Fred J. Underwood. Underwood was the project manager in charge of erection of the large refinery just completed by Barnes for Imperial Oil Co., Ltd., at Edmonton.

Earl Weaver Completes Extensive Canadian Trip

Earl Weaver of Herb J. Hawthorne, Inc., Houston, has recently completed a 5,000-mile trip from South Texas to Edmonton, Alta., Canada, to see Hawthorne bits in action and get performance reports from seismograph parties on the use of this drilling tool.

Weaver visited parties drilling shot holes in the red beds and blue shale of Oklahoma, the sandstone and limestone stringers in North Texas, the cap rock in the Panhandle, the caliche beds in West Texas, the limy sandstone in Eastern New Mexico, the gravel beds in Wyoming, the thick sandstone buttes in Montana, and the glacial drift of Alberta. He covered in detail the performance of the bits in these areas in order to make a comprehensive report to the Hawthorne organization in Houston.

S. D. Day Establishes Manufacturers Agent Firm

S. D. "Steve" Day has announced the establishment of a manufacturers' agency under the name of S. D. Day Co. Company offices will be located at 2017 West Gray, Houston. The principal service of the new company will be the sale of pipe-coating materials and related products to the oil and gas industry. At present Day has national distribution for pipe-line asbestos felt manufactured by Ruberoid Co. The company also represents Griptite Anchors and Stearns Electronic Detector.

Day has been in the supply business in Texas for 20 years and has represented Barrett Co., and has been vice president of Pipe Line Service Corp.

Chicago & Southern Starts Daily Service to Caracas

Chicago & Southern Air Lines, which currently flies four round trips weekly between Houston and Caracas, Venezuela, has stepped up its service to a daily basis. Frank E. Coufal, district traffic manager in Houston for the air line, said that he has been notified by S. A. Stewart, president, that negotiations with the Venezuelan Government have been completed and that June 27 was set as the target date for the inauguration of daily service between Houston and Venezuela.

The air line began service to Caracas in July 1948, on a tri-weekly basis and added a fourth flight in December of the same year. The flights operate via the islands of Cuba and Jamaica. According to Coufal, the air line has desired to provide daily service to Venezuela in the interest of better service to the oil industry, a heavy user of the company's shortcut route to the South American oil fields.

Clinton Machine Makes Mendez Export Manager

Fernando L. Mendez has been appointed export division manager of Clinton Machine Co., Clinton, Mich., it has been announced by Don Thomas, president of the company. The export division will be located at the main plant at Clinton.

F. L. MENDEZ

Mendez brings a lifetime of export and business experience to the company. He received his university education in the engineering college, University of Notre Dame. After graduation, he returned to South America where he engaged in the export business for several years before returning to the United States.

Holmes Joins Sales Staff Of Alice Pipe & Supply

George B. Holmes, widely known oil-equipment supply man, has joined the staff of Alice Pipe & Supply Co. of Alice, Tex. Holmes was formerly with Petroleum Pipe & Supply Co. of Corpus Christi and also Houston Oil Field Material Co. of Corpus Christi. He is widely known among drilling contractors and oil operators, having started in the supply business in Arkansas about 25 years ago.

McCannon in Venezuela

Roy B. McCannon, district manager at Bakersfield, Calif., for Baker Oil Tools, Inc., is in Eastern Venezuela on a trip of several weeks' duration on company business.

Kellogg Transfers Riblett

E. W. Riblett has been transferred from the New York office of M. W. Kellogg Co. to Jersey City as associate director of the petroleum and chemical research laboratory.

American Iron Appoints Taylor as Export Manager

American Iron & Machine Works Co. has announced the opening of its own export office in New York City with J. M. "Jim" Taylor in charge as export manager. Offices will be maintained at 11 West 42nd Street. Taylor has been with American Iron for 14 years, having served in various sales and administrative capacities in the Mid-Continent area. During this time he was division manager in Kansas; division manager of the entire Gulf Coast area, and most recently was special representative at Oklahoma City. American Iron formerly handled their export operations through the agency of John H. Baird in New York City.

Barton Instrument to Erect Larger Plant

Barton Instrument Co., Los Angeles, manufacturers of flow meters and indicators, have begun construction on their new and larger plant located on Eastern Ave. in Los Angeles.

The one-story concrete block building with trussed roof will have a floor area of 8,000 sq. ft. Nine thousand square feet of additional property is available for future expansion. Occupancy will be about July 15.

Champion & Smith Named to Represent Rector in Export

Rector Well Equipment Co., Inc., Fort Worth, has recently appointed Champion & Smith, Inc., as exclusive export representatives in all territory outside the United States and Canada for Rectorhead tubing and casing heads, cementing equipment, Rectorseal, and other Rector equipment. Champion & Smith, Inc., offices are in Houston, New York, and Los Angeles.

General American Announces Exhibit

General American Transportation Corp., widely known as builders and operators of a fleet of more than 55,000 tank, refrigerator, stock, express refrigerator, and milk cars, will be represented at the Chicago Railroad Fair this year by a two-fold exhibit.

It will consist of an all-welded, aluminum tank car and the latest development of refrigerator car for transporting frozen foods. This latter will be used as a display booth, for inside it will be set up as a comprehensive exhibit showing the diversified operations of the company.

There will be dramatic presentations incorporating models of cars, photographs, and actual products. Also featured will be the liquid-storage terminals, bus-building activities, plastics-molding operations, and the fabrication of heavy equipment used in the refinery and process industries, in addition to the company's car-building activities and the design and building of Wiggins floating roofs, gas holders, and other structures for the conservation of valuable, volatile vapors.

W. J. Berry Joins Dearborn As Pipe-Line Engineer

Dearborn Chemical Co., manufacturers of NO-OX-ID rust preventives and NO-OX-IDIZED wrappers, has announced the addition of W. J. Berry as pipe-line service engineer. Berry will make his headquarters in Chicago but will devote his time exclusively to field work assisting and advising pipe-line-construction projects using NO-OX-ID coatings.

Berry has had many years of experience in the engineering field. After graduating in civil engineering

Hughes Representatives Tour Failing Supply Plant

More than 50 men who are employed by Hughes Tool Co. of Houston, attended a sales meeting held recently in Enid, Okla. Present at the meeting were all of Hughes field representatives in Kansas and Oklahoma and also a number of executives from the main office in Houston.

Leon B. Stinson, division sales manager for the Oklahoma-Kansas division, made the arrangements for the Enid meeting. In attendance from Houston were: H. E. Rogers, vice president in charge of manufacturing; M. E. Montrose, vice president in charge of sales; G. J. Meyer, assistant to the vice president in charge of sales; E. R. Woodmansee, tool-joint sales; R. M. Goolsbay, small-bit sales; and Max B. Campbell, senior supply representative. M. G. Clark, special representative of the company from Pittsburgh, also was present. Others who attended the meeting included the following: W. L. Hunter, northern regional manager, Oklahoma City; H. W. Harms, northern regional engineer, Oklahoma City; R. D. Hood, northern regional office manager, Oklahoma City; J. S. George, special representative from Tulsa; L. B. Stinson,, division sales manager, Oklahoma City; P. A. Percy, district sales manager, Hutchinson, Kans.; W. L. Barnes, district sales manager, Oklahoma City; R. R. Aulick, district engineer, Oklahoma City; W. W. Janes, district office manager, Oklahoma City; W. W. Cross, Perry; C. E. Freeman, Jr., Hutchinson; G. O. Griffin, Ardmore; W. G. Griggs, Duncan, Okla.; R. M. Hall, Garden City, Kans.; W. L. Haning, Oklahoma City; H. E. Harris, Oklahoma City; D. L. Hayes, Pratt; W. C. Hughey, Chickasha, Okla.; J. E. McAdams, Oklahoma City; W. C. McAmis, Chickasha; F. W. Martin, Jr., Seminole, Okla.; F. B. Mason, Perry, Kans.; C. B. Morrison, Liberal, Kans.; R. P. Moss, Duncan; L. G. Parrott, Oklahoma City; J. E. Petete, Hays, Kans.; C. L. Pullen, Seminole; J. P. Purdy, Ardmore, Okla.; T. J. Reaves, Winfield, Kans.; G. R. Ritchie, Oklahoma City; O. R. Rogers, Seminole; Jack Ross, Oklahoma City; W. D. Sadler, Hutchinson, Kans.; R. H. Skouby, Elk City, Okla.; H. B. Smith, Perry; R. L. Valerius, Hoisington, Kans.; G. A. Williams, Hays; J. G. Willis, Hutchinson; H. H. Allen, Hutchinson; A. L. Bailey, Oklahoma City; W. B. Garner, Oklahoma City; F. S. Smith, Oklahoma City; J. T. Wright, Oklahoma City.

As a special feature of the meeting, Hughes representatives visited the plant of George E. Failing Supply Co., manufacturers of portable drilling equipment. After a tour of the plant, the group had luncheon in the Failing cafeteria.

Executives and field representatives of Hughes Tool Co. visiting George E. Failing Supply Co. plant during two-state meeting at Enid, Okla.

from Ohio Northern in 1925, he joined D. W. Challis & Son, general contractors, as chief engineer. In 1942 he became associated with Dearborn Chemical Service Co. and was engaged in cable-coating work. Since the war, he has been operating his own contracting firm in Pennsylvania.

Waddell Speaks to Oil Capital NIAA Chapter

M. R. Waddell, director of industrial and public relations for Black, Sivalls & Bryson, Inc., Kansas City, spoke at the June meeting of the Oil Capital chapter National Industrial Advertising Association. Waddell was accompanied to Tulsa by Frank Carter, also of Black, Sivalls & Bryson.

Koppers Announces Changes In Tar Products Division

Three appointments to new administrative positions in the Tar Products division of Koppers Co., Inc., have been announced by J. N. Forker, vice president and general manager of the division.

V. H. Viot, former manager of the personnel section of the Tar Products division, has been named manager of the divisional control section, a position which combines responsibility for the activities of the control section and administrative duties formerly handled by the assistant to the general manager.

A former member of the Koppers law department, A. K. Black, III, has assumed the post of manager of the personnel section of the division.

F. L. Byrom, former assistant to the general manager, has been appointed assistant manager of the Tar Products production department.

Somervell Elected to Board of Carborundum Co.

Gen. Brehon Somervell, president of Koppers Co., Inc., was elected a member of the board of directors of Carborundum Co. at a recent meeting of the board, H. K. Clark, president, has announced.

In addition to being president and a director of Koppers, Somervell also is a director of Eastern Gas & Fuel Associates, Boston; Westinghouse Air Brake Co. and Union Switch & Signal Co., Pittsburgh, and Montreal Coke & Manufacturing Co., of Montreal, Canada.

Patterson Made General Sup't. at Torrance Plant

W. R. Patterson has been appointed general superintendent of the steel department at the Torrance, Calif., plant of National Supply Co. In making this announcement, J. D. Spalding, works manager of the plant, stated that Patterson would also continue in his present capacity as chief plant metallurgist.

The steel department at Torrance includes electric furnace facilities for producing special alloy steels and also complete forge and foundry equipment. In addition, National Supply produces a major part of its heavy duty rotary drilling equipment for the oil industry at Torrance.

Patterson was graduated from Carnegie Institute of Technology in 1936 with a degree in mechanical engineering. He came to National Supply that year as a draftsman in the engineering department and later was transferred to the metallurgical department as a laboratory assistant.

In 1937 he was transferred to the sales department and for 4 years specialized in drilling equipment sales in the Bakersfield, Calif., territory. In 1941 he transferred again to the engineering department as sales engineer and in 1942 returned to the Torrance plant as metallurgist. He was appointed chief plant metallurgist in 1943, which position he has held to the present.

Wieghard Made Manager Of Power Machinery Co.

H. C. WIEGHARD

H. G. Wieghard has been appointed general manager of Power Machinery Co. A. M. Butcher will be manager of the Tulsa territory. Power Machinery Co. was founded by Egon Koehler, well known in the machinery and oil industries before his death in 1948.

Wieghard received a degree from the engineering school of Washington University, St. Louis. He has been associated with Southwestern Bell Telephone Co., Worthington Pump & Machinery Corp., Lummus Co., and Byron-Jackson Co. He joined Power Machinery Co. as manager of the Houston territory in 1943.

Acord Announces New Houston Location

Acord Tool & Supply, Inc., has announced the removal of its warehouse and offices to a new location at 5005 Holmes Road, Houston. The new location gives Acord greater outside storage area and more desirable building facilities.

Acord specializes in reconditioned oil-field machinery and equipment, both on a sale and rental basis. The firm, organized in 1948, claims to have one of the most complete lines of rental tools and machinery available in the area.

Nevill Made President of Houston Engineers' Council

G. E. Nevill, senior development engineer, Cameron Iron Works, Houston, has been elected president of the Engineers' Council of Houston. R. M. Hutchinson, engineer, Houston Natural Gas Co., was elected vice president.

Hackney Opens Branch Office at Houston

Hackney Iron & Steel Co., Enid, Okla., has opened a branch office at 1213 Capitol Avenue, Houston. J. E. May, sales engineer for this company, has been appointed branch manager of the Houston division.

Guests See Ideco Plants on Plane Tour

Tony Woracek, International Derrick & Equipment Co. New York, recently took guests on a tour of Dresser Industry plants by plane. The group visited Ideco's Rambler Rig plant at Torrance, Calif., the Security Rock Bit plant at Whittier, Calif., and Ideco's rotary machinery plant at Beaumont, Tex. Guests on the trip were: E. F. Carney, purchasing department, Asiatic Petroleum Co., Ltd.; E. P. Bresenham, petroleum engineer, Socony-Vacuum Oil Co., Inc.; D. M. Engle, manager, foreign operations, Sinclair Oil Corp.; John H. Bowman, consulting engineer, Creole Petroleum Corp.; L. J. Van Dijk, equipment engineer, Asiatic Petroleum Co., Ltd.; D. E. Davis, assistant production manager, Standard-Vacuum Oil Co.; and D. E. Hopkins, assistant to the manager, foreign department, The Texas Co.

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

ONE Army surplus Buda M. O. 893, six cylinder engine with skid complete, $1,750.00 F.O.B. Houston. W. H. Orr, A 8-6064; #15 Japhet Street, Houston 10, Texas.

FULLY equipped seismic recording unit, 12 traces, modern automatic amplifiers, Koenig built body. Shooting unit complete, good condition. For bargain write Box C-959, The Oil and Gas Journal, Tulsa, Oklahoma.

ROTARY-RIG mounted on Dodge Truck; derrick folds back, ball-bearing crown, swivel, block, rotary. Mission equipped mud-hog, 2⅞ drill. Strong and compact. Money maker for Reverse Circulation, Deep Water Wells, Oil Wells 2500 feet. Address Box 106, Seminole, Oklahoma.

FOR SALE: Failing Model 44, mounted on 1944 Ford V-8 Tandem drive, hydraulic feed, automatic pulldown, 27 ft. mast, raised and lowered by hydraulic cylinders, 4 x 5 Gardner-Denver pump, 17 ft. kelley, 120 N. Rod about 10 bits. Quentin Richey, Stone Fort, Illinois.

FOR SALE: Model KL Cardwell rotary rig—with new 87 foot L. C. Mast, 4,000 feet 3½" J & L Blue Ribbon Drill Pipe. Will sell on reasonable terms. Box C-978, The Oil and Journal, Tulsa, Oklahoma.

FOXBORO Recording Gas Flow Meters—25—Some new, all in first-class condition, complete with mercury and manifolds. While they last $150.00 each. Evaluation and Sales Service. Box 30, Mt. Pleasant, Michigan.

NEW
FRACTIONATING TOWER
REFLUX DRUM

One (1) New fractionating tower, 5'-0" I.D. X 89'-6" over-all height X 1⅛" plate. Thirty-four (34) bubble trays, ten (10) 18"-300# manways. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

One (1) new horizontal reflux drum, 5'-6" I.D. x 18'-6" over-all length x 1⅛" plate. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

ROCK ISLAND OIL & REFINING CO., INC.
235 West Lewis St. Wichita, Kansas
Phone 7-3325

EQUIPMENT FOR SALE

FOR SALE: Model "K" Cardwell, single drum draw works powered by G.A.K. Waukesha engine. Equipped with 98' "A" mast and sub skid. Priced for quick sale. Terms. Melton Supply Co., Seminole, Okla.

ROTARY equipment, almost new, only used few days, 1800' PK rods, Drill collar 30'x4¼" with 3½" box, King water swivel 1¼", PK slips, hoisting plugs, overshot. Complete outfit $4500, or will divide. We handle new and used spudders, rotaries, core drills, pipe, tools, cable. Fishing tools and equipment rented. Pressey & Son, Pueblo, Colo.

FOR SALE: Near Blackwell, 1 Standard Cable Tool Drilling in-Clean out unit on steel skid base, complete, less tools. $1,000. Cities Service Oil Co., H. D. Patridge, Bartlesville, Oklahoma.

FOR SALE: Used storage tanks in good condition. Capacities of 50,000, 60,000, or 80,000 bbls. dismantled present locations Oklahoma and Texas, or erected on your locations at attractive prices. Also offer new tanks any capacity for prompt shipment and erection. ATLAS TANK AND STEEL CO., TULSA, OKLA.

CASING, RIGS, BELTS, TANKS, ENGINES: Everything for Cable Tool Drilling. Bought and sold. Tri-State Oil & Gas Company, Box 827, Phone 7-5121, Parkersburg, W. Va.

FOR SALE: THREE six ton Yale geared trolley-type rail hugger chain hoists, 15 foot lift. In good condition. Box C-979, The Oil and Gas Journal, Tulsa, Oklahoma.

SPECIAL PURPOSE TRACTOR FOR PIPE LINE CONTRACTORS

One TD-14 International diesel wide width modifier tractor with Model PBI-14 Superior-Cardwell pipe laying attachment complete with counterweights, boom and blocks.

Virtually new—used on one job only to cradle 8200' of 6" pipe. Available at Loveland, Texas.

Priced at $9,500.00 for quick sale.

CHARLES A. HOLDEN, Attorney
312 Daniel Bldg. Phone 2-5179
TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000' —Respooled for Your Inspection — Cable Tools for Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

FOR SALE: 10,000 ft. 20" OD x ¼" Wall New Electric Weld Steel Pipe, Double Random Lengths; 50,000 ft. 18" OD x ⅜" Wall Used Steel Pipe, Single Random Lengths. Utility & Industrial Supply Company, 921 Michigan Ave., E., Jackson, Michigan.

COMPRESSOR BARGAIN: 14" and 16" Ingersoll Rand and Worthington Duplexes. All in excellent mechanical condition, 5½" to 16" bore cylinders available. Traders Oil Company of Houston, 821 Esperson Building, Houston 2, Texas.

FOR SALE: Wilson Super Spudder—Double drum, double pole mast, complete with walk ways, roof, wings, and fully skidded—Good Wire—Priced to sell. Wilson Mogul Drawworks, powered by 145 GK Waukesha—Portable derrick—Wilson Snyder 6 x 16 pump, powered by WAK Waukesha—4½" Drill Pipe, Traveling Block, Swivel, 4¼" x 40' Kelly, BJ Tongs, etc.—Priced to sell. Write: T & R Oil Field Machine & Supply Co., Box 98, Carmi, Ill.

FOR SALE: 83-Speed Star all steel drilling machine, mounted on steel skids; and "tailing-in" and "cleaning-out" tools. Price $6000. Mrs. Mary Bliss, telephone 59, Box 338, St. Elmo, Illinois.

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQ'PT. CO.
3415 Westminster, Dallas 5, Texas

CARDWELL
RL CABLE TOOL

Heavy Duty Diesel Motors, rig, double pole A mast, new 4000' drilling and sand line. Complete set 5 & 6" tools, metal, top, walkway, dog house and junk rack. Light plant, diesel and butane tanks. First class condition and now working. For sale or trade for Sullivan, Failing or Franks slim-hole rig that will drill 2500'.

LYNCH OIL CO.
Box 814, Evansville, Ind.

MODERN 7,500' RIG

FACTORY REBUILT WILSON "GIANT" DRAW WORKS
Powered By
THREE RECONDITIONED Le ROI ENGINES

Draw Works torn down, to bare skid, rebuilt to low streamlined silhouette, with greatly simplified controls. All worn bearings, clutches, chains, sprockets, etc., replaced. 500 hp. transmission. New hydromatic brake.

Balance of rig consists of 7¾-in x 18-in. pump and proper size units of popular makes. Including 6,500 ft. of excellent 4½-in. drill pipe with FH Tool Joints.

You will, indeed, be pleasantly surprised at the reasonable price and terms at which this complete rig is offered. Inquire for details.

LUCEY PRODUCTS CORPORATION
OIL WELL SUPPLIES
TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR SALE: New 6-WAKU Waukesha motor complete. Twin Disc clutch, gas-gasoline carburetor. Never out of warehouse. $1,200 under list. $3,750 FOB Odessa. ARROW SUPPLY COMPANY, Odessa, Tex.

SULLIVAN 22 Core Drill. Also truck mounted cable tool rig. Both only slightly used. Excellent condition throughout. R. B. McElwaine, Box 127, Little Rock, Ark.

FOR SALE: Cardwell Model "RL" Spudder complete, Waukesha Motor, almost new lines, steel roof and floor, side curtains, new doghouse, two complete strings of tools, Koehler light plant, 1250 gal. Butane tank—now on location near Grayville, Illinois. Geo. H. Wickham, Box 595, Phone 149, Grayville, Illinois.

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps—two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

NEW

A.P.I. CASING COUPLINGS

1,441—5½" O.D., 8 R. T. Long N-80
794—5½" O.D., 8 R.T. Short J-55
79—6⅝" O.D., 8 R.T. Long J-55
100—7" O.D., 8 R. T. Long J-55
144—7" O.D., 10-V Long J-55
15—8⅝" O.D., 8 R.T. Long J-55

ROCK ISLAND OIL & REFINING CO., INC.
335 West Lewis Street
Wichita, Kansas Telephone 7-3325

LIQUIDATING GASOLINE PLANT
SHIDLER, OKLAHOMA
WILL QUOTE ATTRACTIVE PRICES!

Truscon Steel Buildings

Complete with structural Steel Framing, steel panels, steel windows and doors. Suitable for re-erection.

1—60-ft. x 186-ft. x 10-ft.
1—24-ft. x 36-ft. x 10-ft.
1—32-ft. x 30-ft. x 10-ft.
1—42-ft. x 20-ft. x 12-ft.
1—36-ft. x 44-ft. x 10-ft.

Pressure Vessels

1—Still, 6'0" x 35'0" x 1" shell, 200-lb. W.P. with steam coil.
7—Pressure Storage Tanks, 10'0" x 30'0" x ½" shell; 18,000-gallon capacity.
5—Pressure Storage Tanks, 7'0" x 30'0" x 7/16" shell; 8,800-gallon capacity.
9—Scrubber Tanks, 3'6" x 10'0" x ⅜" shell.
2—Scrubber Tanks, 2'6" x 10'0" x 3/8" shell.
1—Storage Tank, 24'0" x 20'0" x 3/16" shell; 64,000-gallon capacity; riveted construction; open top.

Centrifugal and Reciprocating Pumps and Compressors — Pipe —Valves and Fittings

Write for complete list and quotations

Equipment may be inspected on the Gulf Jessie McComb lease, 1 mile west of Webb City, Oklahoma.

BROWN-STRAUSS CORP.
P.O. Box 78 Phone: L.D. 189
Kansas City 10, Mo.

EQUIPMENT FOR SALE

COMPLETE GENERATING PLANT
Two NT 128-BHP vertical natural gas engines and one 48-BHP, driving two GE 75-KW, 3-phase, 4-wire 120/208 volt, 60-cycle generators and one 30-KW, 3-phase generator respectively. Complete with switchboards and auxiliary equipment. Running and in good condition. Public Market, 311 So. Klein, Okla. City, Okla.

FOR SALE: Wilson Giant draw works, powered by 2—J.L.-1335 Buda engines and Wilson chain compound. Like new condition, with bargain price. Terms. Melton Supply Co., Seminole, Okla.

FOR SALE: Sullivan Rotary Drill Model "N" Trailer mounted, 50 h.p. Buda power, 1900 feet P.K. Rod, Gaso. 4/10 mud pump 33 h.p. motor, many bits, heads, tools, $5000. Ben Sherman, Phone 243, Deming, N. M.

FOR SALE, at Birch Run, Michigan. #50 Oilwell geared power complete. 30 H.P. 2 cycle Type C Superior gas engine. #50 Oilwell belt tightener complete with shaft, bearings, and clutch. Circulating tank. 16' x 19' house. All in good condition. $2000 as it stands. Was used to pump twenty-five 1540' wells in field now abandoned. Smith Petroleum Company, 401 Keeler Building, Grand Rapids, Michigan.

ONE used Ruska Vertical, compensated, ten gamma sensitivity Magnetometer, box, tools, auxiliary magnets, tripod, compass, leather cases. Normal wear outside, excellent inside. Guaranteed performance. William Booth, 619 Truxtun, Bakersfield, California.

For Sale: Copyright 72601
THE ELECTRIC OIL HEATING UNIT
Heats oil to 222 Degrees
CLAUDE RAY JOHNSON
Willoughby Hotel Guymon, Oklahoma

MANUFACTURERS LATEST DESIGN

Hydraulic Casing Pulling Units. Complete line of equipment. Units made to your specifications. Truck Mountings or Skid Units. Repair Service and Parts.

OKLAHOMA MACHINE & SUPPLY CO.
Ada, Oklahoma

NEW 6⅝" O.D. API LINE PIPE

Seventy-three (73) Miles New 6⅝" O.D. 13# API Electric Weld Line Pipe, Plain End, Beveled for Welding, Regular Mill Coating, double random length Van Dyke Protectors Applied. Rock Island Oil & Refining Co., Inc., 335 West Lewis Street, Wichita, Kans. Telephone 7-3325.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

COMBINED VAPOR SEPARATOR AND FRACTIONATOR FOR THERMAL REFORMING

One (1) New 5'-6" I.D. X 61'-0" overall height Bubble Tower made of 1¼" thick, 11-13% chrome Stainless Steel, type #405. Stainless Steel Support Plates in place for fifteen (15) trays, (trays not included). Constructed in accordance with the API-ASME Code, Stress relieved and radiographed. Designed for 400 PSI @ 750° F. Fabricated by A. O. Smith Corporation. Platform and Ladder Clips installed.

WOOD RIVER OIL & REFINING COMPANY, INC.
335 West Lewis Street
Wichita, Kansas Telephone 7-3325

EQUIPMENT FOR SALE

FOR SALE: 7400' 7" OD 20# used 10 V-Thread Lapweld Casing near Electra and Vernon, Texas. 1600' DITTO, near Walters, Oklahoma, 95 cents per foot. 2700' 24# DITTO $1.20 per foot, near Walters, Oklahoma. Cities Service Oil Company, Patridge, Bartelsville, Oklahoma.

UNUSED Steam Engines: Two #7 Oil Well Vertical 310 HP, 300 psi, steam engines. Make offer. Rey Supply Company, Inc., 213 Trade Mart, New Orleans, La.

FOR SALE at Oil Hill, Kansas: 2—80 HP Reeves 4 cylinder vertical gas engines, 9½" x 11", 300 RPM, Mfg. #8036-7. Empire Pipeline Co., Patridge, Bartlesville, Okla.

FOR SALE: One National Shot Hole Drill, solid kelly, Gardner-Denver pump, now working in West Texas. Also 500 gal. Dodge water truck. Box C-968, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE at Oil Hill, Kansas: 2—6" x 10" Worthington Deane Vertical Single Acting Triplex Used Pumps. Fig. No. 1654, Mfg. No. D88396 and 88400, maximum working pressure 425#, capacity 5270 BPD at 42 RPM. Empire Pipeline Co., H. D. Patridge, Bartlesville, Oklahoma.

FOR SALE: Rotary Mast Pole. 1—8" x 10" x 87' Two Leg Mast Pole with 5—24" Roller bearing sheaves in crown. 98'—¾" Raising Line and 110'—½" Telescope line. 1200'—9/16" Guywires and 160'—⅞" Guywire. 1—4000' Double Board. 1—30' Main Skid with upright supports for Mast and well for Rotary table. Denman Drilling Company, Phone 4553, Wichita Falls, Texas.

FOR SALE: 1 Model "K" Cardwell spudding unit powered by D-8800 Caterpillar Diesel motor, 1500 watt covered Kohler light plant on skids. Folding steel flaps for roof and walks, and canvas for inclosure. All steel dog house. Stems, bits, and bailers for 7-in. and 5-in. hole. Rod, tubing, and hand tools. Everything complete for immediate use. Shamrock Drilling Company, Great Bend, Kansas. Phone 5732, P.O. Box 322.

NATIONAL "50" Compound Double Drum Rig 136' Cantilever Ideco Mast, 10' substructure, 6,000' 4½" drill pipe, this rig complete and in excellent condition. P.O. Box 205 Sta. B, Bakersfield, California.

FOR SALE — Michigan — One J 37 Fort Worth Spudder with oil well V-belt, Jack shaft, Buda L335 engine; drilled two wells; complete set drilling tools, 10" down. Casing tools, Kohler light plant. All good condition. Very reasonable. Monroe Marks, Cody Hotel, Grand Rapids, Michigan.

FOR SALE: Practically new 70 B Brewster Drawworks equipped with G. M. Diesel 6 Motor & transmission, all friction clutches—automatic cathead. This drawworks has drilled 35,000 feet in shallow wells—being replaced by larger unit. Price $10,000.00 f.o.b. Salem, Illinois. Herman Graham Drilling Co., Box 176, Salem, Illinois. Phone 580.

FOR SALE by independent producer: 4,000 ft. new 7 inch O.D. 23 pound J 55 and N 80 A.P.I. seamless casing long T & C, 350 ft. new 10¾ inch O.D. A.P.I. seamless casing, and 200 ft. used 10¾ inch A.P.I. seamless casing. Above pipe in Wichita Falls and available at less than out-of-stock price. Box C-991, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE—One hydraulic casing pulling machine, good condition, complete in every detail. Box C-975, The Oil and Gas Journal, Tulsa, Oklahoma.

WE OFFER, SUBJECT TO PRIOR SALE

1—40 H.P., O.C.S., Polly Pumping Unit complete with D.H.K. Waukesha Engine and 12 x 12 Butler Steel Engine House, F.O.B. Kansas $2,500.00.

WEST SUPPLY COMPANY
Chase, Kansas

MAKE US AN OFFER

50,000 ft. new 2⅜" O.D., 2" I.D. 3.67# P.E. seamless steel pipe in 20 ft. lengths. F.O.B. Ypsilanti, Michigan.

Call, write or wire

O. K. PIPE & SUPPLY CO.
P.O. Box 4441, Oklahoma City, Okla.
Phone 6-5447

EQUIPMENT WANTED

WANTED

1,000 feet each of 4" and 8" black pipe. Write Box C-986, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: One right-handed old style 40 hp. Reid gas engine cylinder. 410 Atlas Life Building, Phone 4-1569, Tulsa, Okla.

WANTED Franks used well servicing unit. Advise description, location and price. Box C-972, The Oil and Gas Journal, Tulsa, Okla.

WANTED: 4 single well pumping units for 4,500' wells. Box C-974, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

NEW foreign and domestic Oil Employment Directory. Over 500 listings in drilling, production, refining, natural gasoline, pipelines, geological, exploration, supplies, manufacturers, services; and trucking, refinery and pipeline contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2803, Tulsa, Okla. (Our 29th Year).

CONSTRUCTION MAN

For 2-year project, with civil engineering and pipe line building experience, top references. Address Box C-981, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Superintendent for combination natural gasoline and L.P.G. plant in Texas Gulf Coast area. Give record of past experience. Address Box C-990, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED
EXPERIENCED GAS LIFT ENGINEER

An opening for an experienced gas lift engineer and salesman. Knowledge of fluid weight and pressure differential type required. Reasonable salary commensurate with results. No commissions. Address with full information reply to

BOX C-984
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

WANTED

MECHANICAL ENGINEER

Experienced in design of pumping units and well head equipment. Excellent opportunity for right man to become Chief Engineer for well established company.

State age, qualifications, experience. Address:

BOX C-967
THE OIL AND GAS JOURNAL
TULSA, OKLAHOMA

ENGINEERING

During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

HELP WANTED

LARGE Mid-West Refinery wants man with training and experience as economic analyst. At least 2 to 3 years' experience in Refinery operations, together with engineering background preferred. State experience and qualifications in first letter. Box C-988, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED—Independent company desires experienced engineer to supervise secondary recovery work consisting of waterflooding, gas injection and pressure maintenance projects. Experience in one or more phases of the above desirable but education, training and general production experience will carry considerable weight in selection. Location Tulsa. In replying give full details of personal, education and business history, references and salary expected. All replies will be kept confidential. Box C-971 The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED

An experienced oil field construction engineer for executive position in Venezuela. Good salary and living conditions. Reply P.O. Box 490, Tulsa, Okla.

INSTRUMENT ENGINEER

A major oil company has opening for Instrument Engineer with at least three years of chemical plant or refinery experience. Preference given to man with engineering background. Write Box C-989, The Oil and Gas Journal, Tulsa, Oklahoma, giving qualifications, education, experience, age, and attach a small inexpensive passport photograph.

TOP OPPORTUNITIES FOR OIL MEN

Ass't. Controller	to $15,000
Super. Int. Auditor	to $10,000
3-Accts.-Gen.	to $7,500
Research and Development Engineers	to $7,500
Process Engineers	to $7,500

Above positions are with a major oil company. Real opportunities are offered outstanding men. College degree required. Age 35 or under. Willing to relocate. Must have oil experience. Client will pay all expenses including our fees. Your confidence fully respected.

CADILLAC EMPLOYMENT AGENCY
220 South State St. Chicago, Ill.
Phone Wabash 2-4900

WANTED

WISH TO BUY oil producing properties. State your propositions fully. Information to be held in strictest confidence. Write Box C-980, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

INSTRUMENTMAN, comprehensive and diversified processing experience, underloaded in present connection. Available for responsible assignment, preferably near university. Box C-994, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED Chemical Engineer: M.Sc., 30 yrs., two yrs. development, research experience organic chemicals, supervisory experience, desires production, technical service or development, presently employed. Box C-992, The Oil and Gas Journal, Tulsa, Okla.

AGGRESSIVE, graduate Petroleum Engineer. Six years varied field experience. Presently employed as drilling and production superintendent by independent drilling contractor and operator. Desires to make change. Box C-993, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMICAL Engineer with recent Law Degree, age thirty, married, with three years' experience in Diesel Engineering and two in Mechanical. Desires employment in Petroleum industry. Member Phi Lambda Upsilon and Sigma Tau honorary fraternities. Box C-985, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMICAL Engineer. Four years' experience. Bachelor degrees in chemical engineering and chemistry. Single, 31. Desire work in processing. Box C-983, The Oil and Gas Journal, Tulsa, Oklahoma.

INSTRUMENT ENGINEER—Thirteen years supervisory, engineering, and maintenance experience in petroleum refinery and chemical plants. Box C-977, The Oil and Gas Journal, Tulsa, Oklahoma.

MAN with several years oil refinery experience desires similar position with independent refinery. Box C-953, The Oil and Gas Journal, Tulsa, Oklahoma.

MAN with several years oil refinery management experience desires position as district sales representative for refinery supplies. Box C-955, The Oil and Gas Journal, Tulsa, Oklahoma.

CANADIAN MANAGER AVAILABLE
Graduate Geologist and Petroleum Engineer, three years experience as manager production, Geology, Land and Natural Gasoline Plant western Canada; three years manager for major company Illinois and West Texas. Details and references upon request. Available 30 days. Box C-969, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer desires position in Mid-Continent area with active oil company. Seven years' experience in various production problems, well completions, work-over operations with major company. Now production foreman. Box C-982, The Oil and Gas Journal, Tulsa, Oklahoma.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

SERVICES

25 YEARS' experience buying Oil Leases, Royalties, in Texas, New Mexico, Louisiana, Arkansas, Mississippi. Title work. Services available, salary, commission. A-1 references. Joe L. Ferguson, 115 Wildwood Drive East, San Antonio, Texas.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

CASH MARKET FOR PRODUCING ROYALTIES
ROBERT L. KINKAID
World Bldg. Tulsa, Oklahoma

PRINCIPAL WILL BUY: Group of producing oil royalties and group of producing gas royalties, $5,000.00 to $50,000.00 worth. Send price and monthly income past twelve months to: Box C-949, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASE AND DRILLING BLOCKS

OIL LEASE: 110 acres, Montgomery County, Kans. NE¼ of SE¼ and NW¼ of SE¼ and lots 7 & 8, all in Sec. 1, T-35, R-16 E. Prcu 310'. Squirrel 532'. Bartlesville 660'. Wilcox 1200'. Producing squirrel sand only. 5 wells 15 bbls. Ideal, economical, repressuring project. Price $20,000. Full particulars, M. J. Regan, Coffeyville, Kans.

OIL LEASES for sale in large, small or medium size blocks in Colorado, Wyoming New Mexico, Montana, Arizona. Wholesale or retail. Write for descriptive list. Dyer-OJ 1835 Champa, Denver, Colorado.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Ky

FOR LEASE for oil and gas—acreage in Brazoria County near Angleton, Texas Write E. Hufford, Box 633, Boulder City, Nevada.

WE BUY Salvage Oil Properties and small production. Ben H. Rosenthal, 1901 Republic Bank Bldg., Dallas, Texas.

OIL and wet gas expansion and development practically unlimited in most all East Texas. Let us help with one, checkered, or a block of leases, also mineral rights and land. We have had 30 years' constant contact in this area, and know of many favorable localities. Box C-987, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
Inquiries Invited
B. D. BUCKLEY
60 Broadview Drive, Clayton (5), St. Louis, Missouri

Graham-Paige Corp. Is Entering Oil Business

Graham-Paige Corp. (automotive firm) announced this week it has contracted to establish joint ownership and operating relationship with Deardorf Oil Co. for exploration and drilling for oil and natural gas on Deardorf's leased acreage in the Keyes region of Cimarron County, Oklahoma.

Joseph W. Frazer, president, and chairman of Graham-Paige, said his corporation would also acquire stock options from Deardorf to purchase substantial block of capital stock of the Oklahoma City oil company.

ADVERTISERS

Aerofin Corporation 29
Allis-Chalmers Mfg. Co. 5
Allen's Foundry & Machine Works 120
American Iron & Machine Works Back Cover
American Manganese Steel Div. 127
Anchor Petroleum Co. 32
Armstrong Bros. Tool Co. 121
Attapulgus Clay Company 94
Baker Oil Tools, Inc. 119, 126
Barrel, Inc., Wm. M. 124
Bethlehem Steel Co. 1
Black, Sivalls & Bryson, Inc. 26, 27
Bonney Forge & Tool Works 11
Bovaird Supply Co., The 4
Boyd Company, Clarence L. 96
Brewster Company, Inc., The 19
Cameron Iron Works, Inc. 28
Chapman Valve Mfg. Co. 93
Chicago & Southern Air Lines 22
Classified Advertising 141, 142, 143
Cooper-Bessemer Corp., The 63
Crane Co. 7
Crose Manufacturing Company, Inc. 105
Crutcher-Rolfs-Cummings 102
Darling Valve & Mfg. Co. 21
Dean Brothers Pumps, Inc. 104
Dearborn Chemical Co. 25
Diamond Alkali Company 52
Dow Chemical Co., The 104
Dragon Mfg. Co. 124
Drilling & Service, Inc. 98
du Pont 117
Eagle-Picher Co. 125
Empire Trust Company 130
Falstrom Company 109
Garlock Packing Company, The 106
General American Transportation Corporation 77
General Electric Company 2
GMC Truck & Coach Division 17
Goodrich Company, B. F. 3
Grancell, I. H. 111
Grant Oil Tool Co. 123
Groban, Milt 126
Gunite Concrete & Construction Co. 109
H & M Pipe Beveling Machine Co. 103
Hinderliter Tool Co., Div. H. K. Porter Company, Inc. 112
Hughes Tool Co. Front Cover
Hunt-Spiller Manufacturing Corp. 24
Jewel Manufacturing Co. 108
Jones & Laughlin Supply Co. 6
Kellogg Co., The M. W. 64
Koehring Company 8, 9
Kwik-Mix Company 8, 9
Larkin Packer Company, Inc. 95
Lister-Blackstone, Inc. 116
Manning, Maxwell & Moore, Inc. 113
Martin Iron Works 121
Mayes-Bevan Company 114
McCord Corporation 109
McCullough Tool Company 92
McKee & Company, Arthur G. 20
Mission Mfg. Co., The 68
National Airoil Burner Co., The 103
National Aluminate Corp. 51
National Supply Co., The 66, 67
Norris Brothers, Inc. 104
Norris Manufacturer, Inc., W. C. 30
Ohio Injector Co., The 73
Oil and Gas Journal, The 131
Paddock Sales of Texas 122
Pelican Well Tool & Supply Co. 122
Penberthy Injector Co. 103, 108, 111, 122, 124, 127
Perrault Brothers, Inc. 103
Petroleum Distributing Co. 112
Petroleum Electric Power Assn. 110
Pipe Line Service Corp. 105
Pittsburgh Valve & Fittings Corp. 80
Porocel Corporation 94
Post Company, Frederick 101
Powerr Regulator Co. 86
Reed Roller Bit Company 74
Republic Steel Corporation 12, 13
Rig-A-Lite 122
Ross-Martin Company 121
Ryerson & Son, Inc., Joseph T. 90
Santa Fe System Lines 91
Skinner Company, M. B. 102
Smith Corporation, A. O. 23
Standco Brake Lining Co. 112
Taylor Forge & Pipe Works 96
Taylor Instrument Companies 10
Tension Envelope Corp. 124
Thomas Flexible Coupling Co. 87
U. S. Treasury Department 133
United States Rubber Company 79
Wallace & Tiernan Products, Inc. 113
Warren Petroleum Corporation 34
Washington Engine & Pump Co. 113
Water Cooling Equipment Co. 14
Waukesha Motor Company 129
Well Equipment Mfg. Co. 118
Wheatley Pump & Valve Mfg., Frank 128
Wheel Trueing Tool Co. 88
Wheland Company, The 15
Wickes Boiler Company 16
Wyatt Metal & Boiler Works Inside Front Cover
Young Radiator Company 18
Youngstown Sheet & Tube Co. Inside Back Cover

CALENDAR

August

United Nations Scientific Conference on the Conservation and Utilization of Resources, U. N. Interim Headquarters, Lake Success, N. Y., August 17-September 6.

September

Interstate Oil Compact Commission, summer quarterly meeting, Stanley Hotel, Estes Park, Colo., September 1-3.

Instrument Society of America, annual meeting and exhibit, Municipal Auditorium, St. Louis, September 12-16.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

American Gas Association, annual convention, Chicago, September 17-20.

American Institute of Chemical Engineers, Mt. Royal Hotel, Montreal, September 18-20.

American Association of Oilwell Drilling Contractors, ninth annual meeting, Baker Hotel, Dallas, September 19-21.

National Butane-Propane Association, Jefferson Hotel, St. Louis, September 19-21.

Mid-Continent Oil and Gas Association, twenty-seventh annual convention, Louisiana-Arkansas division Roosevelt Hotel, New Orleans, September 22-23.

American Institute of Mining and Metallurgical Engineers, regional meeting, Neil House, Columbus, Ohio, September 25-28.

American Society of Mechanical Engineers, fall meeting, Erie, Pa., September 28-30.

October

American Society of Mechanical Engineers, petroleum division, 1949 Petroleum Mechanical Engineering Conference, Biltmore Hotel, Oklahoma City, October 2-5.

National Association of Corrosion Engineers, South-Central Regional Division, annual meeting, Adolphus Hotel, Dallas, October 3-4.

National Lubrication Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Plaza Hotel, San Antonio, October 5-7.

American Society for Testing Materials, first Pacific area national meeting, Hotel Fairmont, San Francisco, October 10.

Texas Mid-Continent Oil and Gas Association, annual meeting, Rice Hotel, Houston, October 13-14.

American Gas Association, annual convention, Chicago, October 17-20.

NOMADS

Houston Nomads, second Monday of each month, Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

Where do we go from here?

NOW as never before, America stands at a cross-roads. One road is the way of easy promises by which we hope to arrive in the Never-never land of abundance for all and hardship for none.

The other way looks very much like the road we have traveled--the way that built America into the richest, strongest, most envied nation of all time. It is the road built by enterprise and resourcefulness and hard work--and thrift.

As a community leader it is your responsibility to help America choose the road we are to follow.

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York
MANUFACTURERS OF CARBON, ALLOY AND YOLOY STEELS

ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES.

AMERICAN IRON & MACHINE WORKS CO.
OKLAHOMA CITY U.S.A.

DESIGNED RIGHT
MADE RIGHT

AMERICAN IRON

VALVES & SEATS

1. Our exclusive design first brings lip of insert in contact with top of seat . . .
2. Taper of insert is next brought into contact with taper of seat . . .
3. Taper of valve body next contacts taper of seat . . .
4. Bottom of Valve body then contacts top of webs in seat, but only after being cushioned by three previous contacts.

Designed right! Made right! That's why you get more from your pumps with American Iron Valves & Seats! You get extra service from our famous Compound 808 insert — the only insert kept in constant compression for longer life! In our three web seat design (originated by American Iron) you get the greatest fluid passage consistent with long-lasting performance. From start to finish . . . feature after feature . . . these valves and seats are designed right, made right — precision made — for long-lasting performance!

Available Thru Your Supply Store

AMERICAN IRON & MACHINE WORKS CO.

Oklahoma City, Oklahoma—Box 1177—Phone L. D. 518—District Office, Houston, Texas
Export Office: 11 West 42nd St., New York City, N. Y.

REMEMBER THERE IS AN "AMERICAN IRON" SERVICE MAN IN EVERY ACTIVE FIELD